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THE IRON AGE

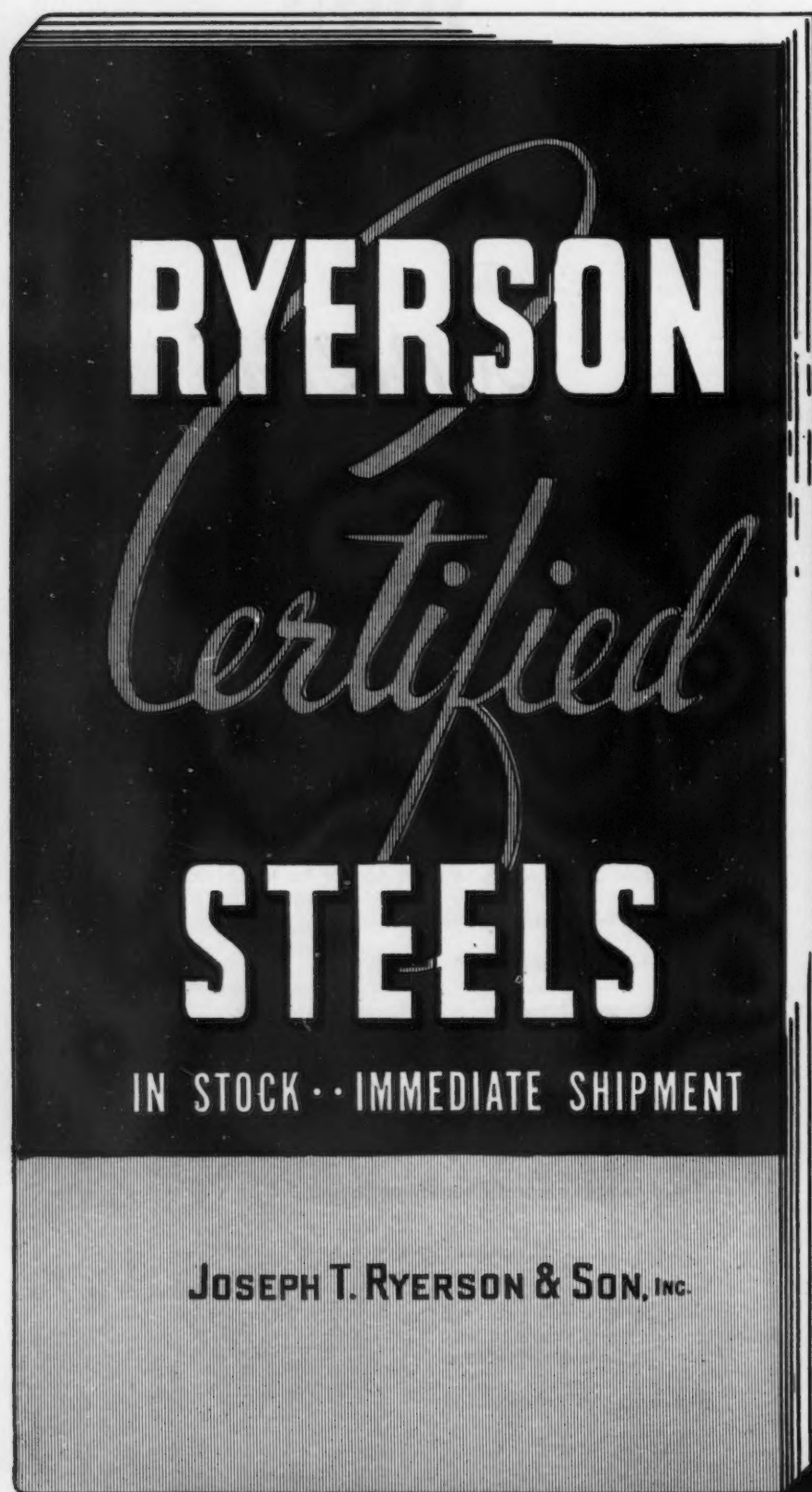
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THE IRON AGE

ESTABLISHED 1855

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Motes and Beams

SCRIPTURE admonishes each of us to remove the "beam" from our eye before we comment upon the "mote" in our neighbor's. That is another way to tell the pot not to call the kettle black.

One thought has a habit of leading to another and this one brings up the question: "Where did Government obtain the necessary skill and experience to be able to tell private industry how to manage its affairs?"

Even though the business man is no longer plagued and haunted by the authoritarian application of the three "R's" of school days, nevertheless three "R's" still pursue him. They, too, are of authoritarian application but they differ from "readin', 'ritin' and 'rithmetic" in more ways than one. For Reform, Revolution and Regulation of business do not follow the rules either of logic or precedent. And the teachers of "readin', 'ritin', and 'rithmetic" probably understood most of that which they endeavored to impart.

With the last of the three modern R's, business has no particular complaint as to principle. Regulation of business is admittedly essential even in a democracy and beneficial if intelligently applied.

Business men realize that somebody has to enforce the rules. Dr. Einstein, intellectually superior to most of us, would have no complaint to make even if some "rookie" officer of the law told him to "move on and cease blocking traffic."

Business knows that there must be an umpire for the game. It expects the umpire to enforce the established rules. But it objects to his making them up himself or changing them every inning. And it objects to having the umpire attempt to pitch, catch, field and bat for both teams. Business is inclined to ask a government umpire who attempts such detailed and specialized performance: "On what sand lot did you get your reputation?"

Financial management, for example, is highly important to private enterprise. A matter of life and death. Do you know of any private concern that could survive nine continuous years of "red ink"?

And then take that highly important matter of the selection of executive personnel. One shudders to think of what would happen to the stock of U. S. Steel or General Motors if these concerns should select swing band leaders to head their subsidiaries, piano tuners for sales managers and dog-catchers for production chiefs. Certainly Government, in filling appointive "top" jobs appears to care as little for specialized skill and experience as in the mythical case cited. Perhaps the theory is to have the "know how" at the bottom and the "know who" at the top.

There is still another "R" that follows revolution, ill considered reform and over-regulation. It is Ruin.

The public might be well advised to request Government to present its credentials before it proceeds further toward undertaking the management of business. Lest, perhaps, the fourth "R" catch up with the other three.

John Van Dine



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GRAY *and* MALLEABLE IRON

By ENRIQUE TOUCEDA

IN this the first section of a two-part article dealing with improvements in the manufacture of gray iron and malleable iron castings, the author discusses some of the history of gray iron difficulties, and then describes changes made in manufacture which resulted in high-grade castings made to consumer specification.

IN a brief recital of this kind, remarks regarding improvements in the manufacture of gray iron and malleable iron castings must necessarily be restricted to high points only. However, before this is undertaken certain details will be touched upon, to the end that a more or less clear idea will be had of the situation that existed in both the jobbing gray iron, and malleable iron foundries a few years prior to the present century; subsequently, when a rather slow and very gradual improvement took place,

and finally during the past ten or so years when developments were both outstanding and rapid.

As the essential raw material for the manufacture of either type of casting is pig iron, and because of certain serious handicaps under which the gray iron founders labored, it will serve the purpose of this article best to start first with a description of some of the conditions that existed in blast furnace practice, in the case of those furnaces that specialized in the sale of foundry coke iron.

The blast furnaces in which coke iron was made were very small as compared with the modern type. That is, their capacity was of the order of 175 to 225 tons daily, with the result that the casts did not average more than 25 to 40 tons each. Unfortunately for the founder, the composition of the casts frequently varied greatly from each other in both silicon and sulphur content, and while the blast furnaces had small chemical laboratories connected with them, these mainly were used for the analysis of their ores, limestone, and coke. Analyses also were made of all casts, for

silicon, and sulphur, and occasional ones for phosphorus and manganese, but very rarely for carbon. This element could not be controlled in the blast furnace either by a change in the furnace charge or through furnace temperature, a fact, however, that was of no importance to the gray iron founder as his mixture was melted in the cupola in contact with coke, so that irrespective of what might have been its amount in the pig iron, he had no means of controlling its total percentage in the castings. Ordinarily, the total carbon in the pig iron averaged about 3.50 per cent.

At this time the analytical work was not done for the benefit of the founder, but as an aid to blast furnace control, because of the fact that the sale of pig iron was based entirely upon the appearance of its fracture.

Every blast furnace company's pig iron was known and sold under a brand name, such as Buffalo, Niagara, Iriquois, etc., and naturally each founder favored that special brand which when used had resulted in a minimum of complaints from his customers. The grading of the pig iron

was based on the appearance and character of its fracture in respect to grain size, there being a slight difference in grading between the Northern and Southern furnaces.

The grades in the North were No. 1X, No. 2X, No. 2 Plain, No. 3, Gray Forge, Mottled, and White. The fracture of No. 1X was one of very open grain which extended uniformly from center to edges of pig. The grain of No. 2X was just slightly finer at center than No. 1X but closer towards the edges. No. 2 Plain was still finer in grain than No. 2X, while No. 3 was still finer grained than No. 2 Plain. The last three grades listed were not used for gray iron foundry work. The reason for the establishment of this very unscientific and impractical method was due for the most part to the founder himself.

Machining Paramount

Both the ferrous and non-ferrous jobbing foundries were operated by men who unquestionably, in view of their accomplishments as molders and because of the handicaps under which they labored, deserve a great deal of credit; for operations necessarily were of a wholly empirical and routine character. Neither the gray iron nor the malleable iron founder knew anything about metallurgical principles or other essential details that today would be considered commonplace.

What they did possess, however, was a high order of craftsmanship, and the ability to turn out fine looking castings true to pattern. Inasmuch, however, as there was no plant inspection of the gray iron castings by the customer, whether they were weak or strong, hard or soft, or might contain internal defects was not questioned. There was, however, one stipulation in the case of gray iron castings that invariably was made, namely, that unless the castings could be machined with ease they would be rejected; for from a very sad experience the customer knew that the founder had little control over the degree of hardness or softness of his product.

The gray iron founder, in ignorance of the effect of the two dominant constituents in pig iron that would have enabled him to control this property, was obliged to resort to the only expedient at hand, viz., an examination of the fracture of the pig iron—that is, he assumed that if a pig iron was used that had a soft looking texture, and the fracture of which had large crystalline grains extending from center to edges of the pig, the castings would surely inherit the same charac-

teristics. In this assumption, for various reasons, he was frequently misled. For example, at times in the summer the cast house might be hot and the sand beds very dry, and coupled with this the weight of the pig and its cross-section greater than that of some other brand, under which circumstances the rate of solidification of the pig would be so slow that its grain size, even if its silicon content was rather low and its sulphur fairly high, would, owing to its fracture, be graded as No. 1X, while a smaller sized pig, due to its more rapid cooling, would be graded as a No. 2X or even a No. 2 Plain, notwithstanding the fact that its silicon was much higher and its sulphur lower than in the case cited.

On the other hand, the cupola coke that was being used by the founder might be very high in sulphur and the castings hard on that account, while the scrap was of unknown composition, all of which factors operated to place the founder in a continual state of perplexity.

The practice of the jobbing gray iron founders in the days referred to was to make use of but one brand of pig iron, which was chosen because after numerous trials with various other brands, the one selected had yielded a better average quality of castings than obtained when some other brand was used, especially in respect to machineability, an expedient, however, that proved to be of scant assistance in their efforts to iron out their troubles.

Two Brands Used

Then, in the thought that possibly if a cupola mixture in which two brands instead of one was used, better control would follow, this became the practice. As this scheme resulted in some improvement, it was but logical for the founder to conclude that if through the use of two different brands better general results were secured, the use of three or more brands would make for a still further betterment, especially in respect to uniform machining characteristics, a practice that universally was adopted. Obviously, the reason for the betterment that followed was because in accordance with the law of averages three or even two different furnaces would not be liable to be off grade at the same time.

As compared with the situation today, the blast furnacemen were not as well equipped metallurgically, while the furnaces, furnace lines and tops, furnace accessories, and stoves were

of a poor design. The coke in many instances not only was too soft, but too high in sulphur, while the influence of slag bulk in respect to the amount of sulphur elimination was just beginning to be realized.

Inasmuch as it was not the practice to size the ore, limestone and coke, the stock in the blast furnace settled irregularly, so much so that due to channeling, scaffolding and frequent slips, a morning cast might be a No. 1X and the afternoon cast a No. 3 grade. The pigs were removed from the cast house on narrow gage cars to a trestle from which they were dropped one by one on the edge of a very large and heavy wedge-shaped casting, in order that they could be broken in half for a fracture examination and grade determination. There was no standard size of pig, some having a considerably larger cross-section than other brands, which so profoundly affected the rate of cooling and consequently the grade, that no real dependence could be placed on fracture as a guide.

Chemical Analyses Used

Inasmuch as there was a difference in price of about \$2 per ton between a No. 1X and No. 2X grade, and a corresponding difference in price between the other grades it is easy to see to what extent the furnaceman, if he were aware of the fact, and a large number were not, could have availed himself of this fact to his financial advantage. In short, there were numerous reasons why the founder was continually at sea and mystified in his efforts to produce day in and day out the exact character of castings desired by his customer.

These facts have been entered into simply in order that the reader will understand to what extent the founder was handicapped prior to the time when it was realized that chemical composition of the pig iron and not its fracture was the only safe guide to follow in the making of his cupola mixture.

As in the case of many innovations, this proposed change in practice met with considerable resistance upon the part of the foundry superintendent, who had convinced the management that his chief value to them lay in his uncanny ability to tell, through an examination of the fracture of the pigs, all about the suitability of a shipment of pig iron for the work in hand. The thought was resented that a cupola mixture could be more intelligently made by some clerk in the office who had had no foundry experi-

ence, than by the practical man in charge of this work.

Iron Purchased by Analysis

Actually a substantial number of years passed before the majority of the foundrymen became reconciled to

event, for the time came when for reasons of economy most of the foundry blast furnaces instead of casting their pig in sand, made a casting machine product in chill molds.

Gradually, the control of pig iron composition in the blast furnace be-

capacity in which the metal became thoroughly mixed. The ladle is then taken on the wide gage car on which it is mounted to the casting machine where it is cast into pigs, which are discharged from a conveyor of which the pig molds form a part, from which they are discharged directly into cars for shipment to the customer. Not only has this been the situation for quite some years back, but still further improvement has been made in that all of the products entering the furnace are sized and the metal from cast to cast is much more uniform than formerly.

The ultimate strength of gray iron castings varied from 16,000 for the soft to around 21,000 lb. per sq. in. for the stronger irons. The first effort to increase the tensile strength was through the addition of steel to the mixture, that is, the production of the so-called semi-steel castings. Tensile strengths were then obtained that varied between 25,000 and 35,000 lb. per sq. in., depending upon the percentage of steel used in the mixture.

Effect of S, Si and Mn

With the passage of time, and largely through metallurgical information that was made available to them through technical papers on the subject that were prepared and read at the A. F. A. meetings, and afterwards by the addition of technical graduates to their operating force, the foundrymen became familiar with the influence exerted by the various constituents in the cupola mixture that make for such diversified properties in the castings as might be desired by their customers. The effect of silicon, sulphur, and manganese on the chilling properties of the metal became known, the control of the degree of hardness or softness desired, the effect of alloy additions to the mixture in respect to mechanical properties, wear, heat and corrosion resistance properties, and coincident with what has been set forth in the foregoing, cupola practice and foundry work generally were improved. That is, molding machines and sand blast equipment were better and more efficiently made; molding sand properties were investigated; and in the larger foundries sand testing equipment installed; sand conditioning and handling were undertaken during this period, and finally the development of the completely mechanized foundry in which control all along the line has become more exact. A change of bee-hive for by-product coke resulted in better and more efficient cupola and blast furnace operations, in connection with a lower



OVERHEAD ladle delivering gray iron to a hand ladle in the plant of a large Detroit automobile manufacturer.

the change, and only then with reluctance. The writer, therefore, would consider that the first improvement in gray iron practice was the purchase and use of the pig iron on an analysis basis, a practice that would have been forced on the foundryman in any

came greatly perfected over what previously had obtained, for considerable advancement not only had been made in blast furnace design, capacity, and practice, but the metal was allowed to run from the furnace into large ladles of from 75 to 125 ton

average sulphur content and a somewhat superior melting ratio.

Today the foundryman is well posted regarding the action of the various constituents in an unalloyed casting, not only in regard to how their different percentages will affect the casting structure, but also just how these various constituents will in turn be affected through the addition of the various alloy metals that may be added to his cupola mixture. Through the use of the alloy metals, he has at hand the ability of furnishing his customer with a great diversity of castings, entirely suitable for the use to which they are to be put. For example, he knows and is familiar with those constituents that favor or oppose the formation of a chill; and he likewise is familiar with the effect of such metals as chromium, nickel, molybdenum, copper, cobalt, vanadium, titanium, calcium silicide, silicon carbide, etc., on the mechanical properties, the wearing, heat and corrosion resistance properties of the castings.

Effect of Chromium

The founder has learned that through a relatively small addition of nickel, aluminum, or titanium, which like silicon act as graphitizers, machineability can be improved, and that with larger amounts of nickel, a harder and stronger metal having a better structure can be made, and with a still higher percentage, say around 12 to 14 per cent, an austenitic gray iron can be produced that will be fairly resistant to growth. Also, it became known that the effect of chromium is to increase the chilling action of the iron, make it harder and more resistant to heat and wear, while it has an effect on the texture of the matrix of the castings. The amount added usually varies from around 0.25 to 1.25 per cent, although difficulty of machining is increased with an increase in chromium content.

The usual practice is to use a certain amount of nickel with the chromium in the ratio of $2\frac{1}{2}$:1. The Brinell hardness of a white iron can be increased considerably in excess of what it would stand if no nickel-chromium had been added, through an addition of 4.5 per cent of nickel and 1.5 per cent of chromium to the metal.

The effect of molybdenum is to increase the tensile and transverse strength of the castings and it is added in an amount that varies from 0.25 per cent to somewhat over 1 per cent, while copper up to 1 per cent is used to enhance corrosion resistance, and at times titanium and aluminum,



THIS truck carries charging buckets to the cupolas in a Detroit autom

which act like silicon, are used to decrease the chilling action of the iron.

Consequently, as compared with the low strengths of the unalloyed gray iron castings that still are used in large quantity, that run in Brinell hardness from 130 to 220, there can be had today, castings with an ultimate strength anywhere from 35,000 to around 60,000 lb. per sq. in., or somewhat more.

However, the attainment of a high tensile strength results incidentally to the securing of the other properties desired and actually is not sought, for the higher the tensile strength the less the ease with which the metal can be machined on the one hand, and on the other, such castings are not used for parts that are to be in direct tension. If toughness and stiffness were the accompaniments of high tensile properties the situation might be somewhat different, but this is not the case; for the castings still are brittle irrespective of how high may be their ultimate strength, while the modulus of elasticity is increased but to a slight degree. Contrary to what obtains in the case of other ferrous products, the compressive strength of

gray iron is four to five times greater than its ultimate strength in tension.

The foundryman has learned the effect of alloy additions to his cupola mixture, in respect to the control of the size and distribution of the primary graphite particles and in respect to the wearing, heat and corrosion resistance properties, as well as their effect on the constituents in the matrix of the casting, the properties of which can be varied depending upon the percentage of pearlite that intentionally has been produced in the matrix, as well as the particular form in which the pearlite subsequently may be modified if the castings are heat treated.

Heat Treatment Requires Skill

The founder also has learned that the structure and mechanical properties of both the unalloyed and alloyed castings can be changed through the use of a proper heat treatment. In the case of the former, the castings can be annealed in such a manner that fairly soft castings can be made still softer and be machined at practically brass speed, while castings that contain some free cementite, especially in corners that have been chilled, can



Detroit automobile foundry.

be softened to such a degree as may be desired. Also, the impact strength of alloyed castings can be increased through an appropriate heat treatment. In order to increase abrasion and wear resistance, quenching and drawing can be resorted to. However, this character of work is done only in those foundries in which the intricacies involved in such treatments are well understood. Obviously, a casting that has not been annealed will not be wholly free from internal strains, while if heat treated under certain conditions the internal strains must be relieved.

There are two general classes of cupola iron, namely, white iron, in which all of the carbon is combined, and gray iron in which a part only of the carbon is in the combined state, the balance being present as primary graphite. The higher the percentage of the former, the harder the iron, while the higher the percentage of the latter the softer. White iron castings are used for a variety of purposes, such as for crusher jaws, or for parts that are required to resist severe wearing condition, and, as has been stated, through the addition of

nickel and chromium, their Brinell hardness can be increased to as high as 700.

Because of the fact that gray iron castings are the cheapest of any ferrous castings to produce, coupled with their good surface, trueness to pattern, sharpness of ornamental design, adaptability for either very small or very large castings, and diversity as to mechanical and other desirable properties, that today are under excellent control, there naturally is a large demand for their use by many different industries. Consequently, since the advent of the alloy casting, their field of application has become very broad indeed. The mechanical properties of these castings have a wide spread, depending not only upon the size and distribution of the graphite flakes, but on the character of the matrix. Inasmuch, however, as the castings lack a high degree of toughness as well as stiffness, they are unable to withstand what could be considered moderately severe service if subjected to dynamic stresses, a handicap that is not too great for there are numerous applications in which the castings would not be subjected to severe impact in service.

A large amount of tonnage goes into water pipe, gas mains and fittings, and for hydrants and large valves. Chilled car wheels and rolls also make use of a large amount. The automotive industry uses a substantial quantity for cylinder blocks and heads, and for numerous other parts. The agricultural and textile industry are large consumers, while the general machinery industry makes use of a substantial amount for cylinders, liners, bed plates, fly wheels, housings, machine frames and other detailed parts too numerous to mention.

The improvements that have taken place in the gray iron foundry industry generally have been of a very substantial nature. With the abandonment of all attempts to base their mixture on the fracture of the pig iron and the substitution of analysis as the basis on which the mixture was made, came the really first step towards real progress. Then came a more intimate knowledge of metallurgical principles generally and the adoption of these principles to the work in hand. This was followed by improvements in molding and core blowing machines, and a better knowledge of molding sand, core sand and facings, with an installation of sand testing equipment attached to foundry laboratories.

The cupola was improved, charging apparatus added, and means adopted

for measuring the quantity of the blast, and the use of fore-hearths to facilitate the more uniform mixing of the iron from the cupola. In some instances hot blast was used, and other advances include mechanical handling of the iron to the molding floor, geared and insulated ladles with covers being used in numerous instances, as well as power trucks of diversified design for moving materials and castings from place to place.

Subsequently, demands came from concerns that needed castings having special properties, and experiments were conducted with different alloy metals. This yielded splendid results so that today the industry is capable of meeting most of the demands with which it is confronted.

Transverse Tests Optional

Great improvements have been made in the case of special products, such as in the case of the centrifugal casting of pipe that now has a better inside and outside surface, a more uniform structure with less defects, and with better deflections. Also, a similar situation has taken place in the case of chilled car wheels and rolls.

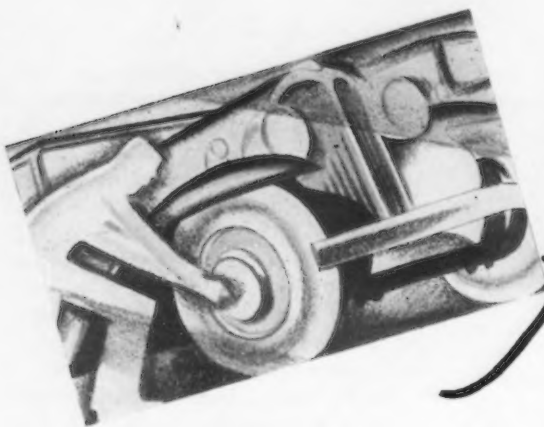
American Society for Testing Materials specification A-48-36 applies to gray iron castings where strength is a consideration.

Quoting briefly from this specification, it is found that there are seven classes as follows: Classes No. 20, No. 25 and No. 30 cover the ordinary grades of gray iron castings and the minimum tensile strength requirements are respectively 20,000, 25,000 and 30,000 lb. per sq. in. The other four classes which cover the high strength irons are No. 35, No. 40, No. 50 and No. 60; and the minimum tensile requirements are 35,000, 40,000, 50,000 and 60,000 lb. per sq. in., respectively.

The transverse tests shall be optional. There are three standard sizes of transverse test bars, namely, "A," "B" and "C," dependent upon the thickness of the casting section.

Increased knowledge covering the properties of special alloys and of the heat treatment of alloy castings, coupled with better design through co-operation with the engineer-designer, has greatly increased their application. Many changes have taken place so gradually that what was considered new a few years ago is now commonplace at present time.

Ed. Note—Next week the author will conclude his discussion with a review of the malleable iron industry, setting forth current technique in the production of dependable malleable castings designed for specific applications.



Handling Materials

BY FRANCIS JURASCHEK

MASS production methods must hinge directly on an *organized* plan of materials-flow. Without such a plan, carefully worked out to the most minute degree, bottlenecks would inevitably occur at many different points, and the resulting production jams would make anything approaching efficiency in manufacturing and assembling simply impossible.

Nowhere is such an organized plan so completely exemplified today as in the building of automobiles. In the plant of Pontiac Motors, at Pontiac, Mich. a recent study throws some interesting highlights on such problems. Here, raw materials, semi-finished parts and stock, finished parts and miscellaneous supplies come in daily. All these goods must be unloaded promptly and taken to various departments or stock rooms within the plant, whence they are fed out as production demands are to be met. On top of this comes the huge job of moving materials and parts through the different processes of manufacturing and assembling, from one operation to another and to the various assembly lines which converge on the master car-assembly line, all with the regularity of clockwork, and each so timed that, as a final result, a completed automobile rolls off the line every minute of the working day.

In one year's time, some 380,000 tons of materials, parts and supplies were received at the Pontiac plant, and, after many handlings within that plant, emerged in the form of 236,000 complete automobiles. Merely to receive and adequately dispose of such tonnages is a problem in itself of no mean proportions; but to receive and fit these goods day by day and minute by minute into a fast-moving assembly line is a job which requires as much of campaign strategy and co-ordinated staff-work as putting an army into the field prepared in every way to meet a foe worthy of its mettle.

Little more can be done within the scope of this article than to take a peep behind the scenes and to see how the parade is organized. The first and most obvious fact which is immediately apparent is that practically every type of materials handling equipment has a place in the scheme. The second fact (which becomes apparent only after the whole panorama melts into a single vivid impression) is that every operation, no matter how small, is coordinated with all other operations, as to receipt, movement, and disposal of every item handled; so that everything always moves forward progressively toward a single ultimate objective—the finished automobile. It is only when this second fact is carefully studied that the real magnitude of the operations involved can be grasped.

Although spread out over a large area of ground-space, the plant layout is very logical. A simplified, schematic diagram is shown on the accompanying chart (Fig. 1). This shows that all incoming materials are roughly divided into four classes: raw materials for producing castings, and steel forgings for such parts as axle shafts, crankshafts and gears, all of which in the course of production must move through a machine shop; steel for pressed metal parts, and wood, rubber, glass and textiles, all of which go into the car-building processes. A master assembly line runs through the middle of the plant; on one side of this are located the foundry and the machine shop, and on the other side the pressed metal and painting departments. From both sides parts flow to the master assembly line, and here the car grows by accretion as it passes through station after station.

It will be noticed that a series of numbers have been printed on the schematic diagram. These numbers very roughly indicate a sequence of production flow. By following the numbered operations in order, it is

possible to take a trip through the plant, and from the standpoint of the materials handling operations involved, see how the car is built. So get an identification badge, pin it on in plain view, and start the trip.

(1) A powerful 10-ton overhead traveling crane equipped with an electric magnet is used outside the foundry for unloading, transferring and re-loading the pig iron, scrap iron, and scrap steel that is to be melted in the four foundry cupolas and poured into cylinder blocks, clutch-housings, manifolds, and other cast parts.

(2) A 5-ton industrial charging truck, used to carry buckets containing the mix for a cupola charge between the mixing car and the bottom of the cupola elevator in the foundry. The buckets slip into the fork of the truck, which lifts them clear of the floor.

(3) Here a hand-ladle is filled from a big traveling cupola-ladle. Several of these overhead ladles attached to cabs hung from monorail track operate from the four cupolas to serve the hand-ladles at all the casting lines.

(4) The largest casting operation in the foundry is that of the engine blocks. Molds move along the engine block conveyor line, while the workmen ride along with them on a separate moving walk (see Fig. 2) which reduces movements to a minimum and permits the workers to direct the stream of molten metal with steady hands. The ladle, suspended from an overhead track, likewise moves with the men. This block conveyor line has a capacity of 120 molds per hr. Ventilating system openings in the background clear the air and carry off fumes, dust, heat and grit, quickly.

(5) A traveling chain type motor assembly conveyor carries the machined engine blocks past stations at which workmen fit various assembly parts into place. Here, crankshaft bearings also are installed.

(6) An overhead conveyor system

for 236,000 AUTOMOBILES...

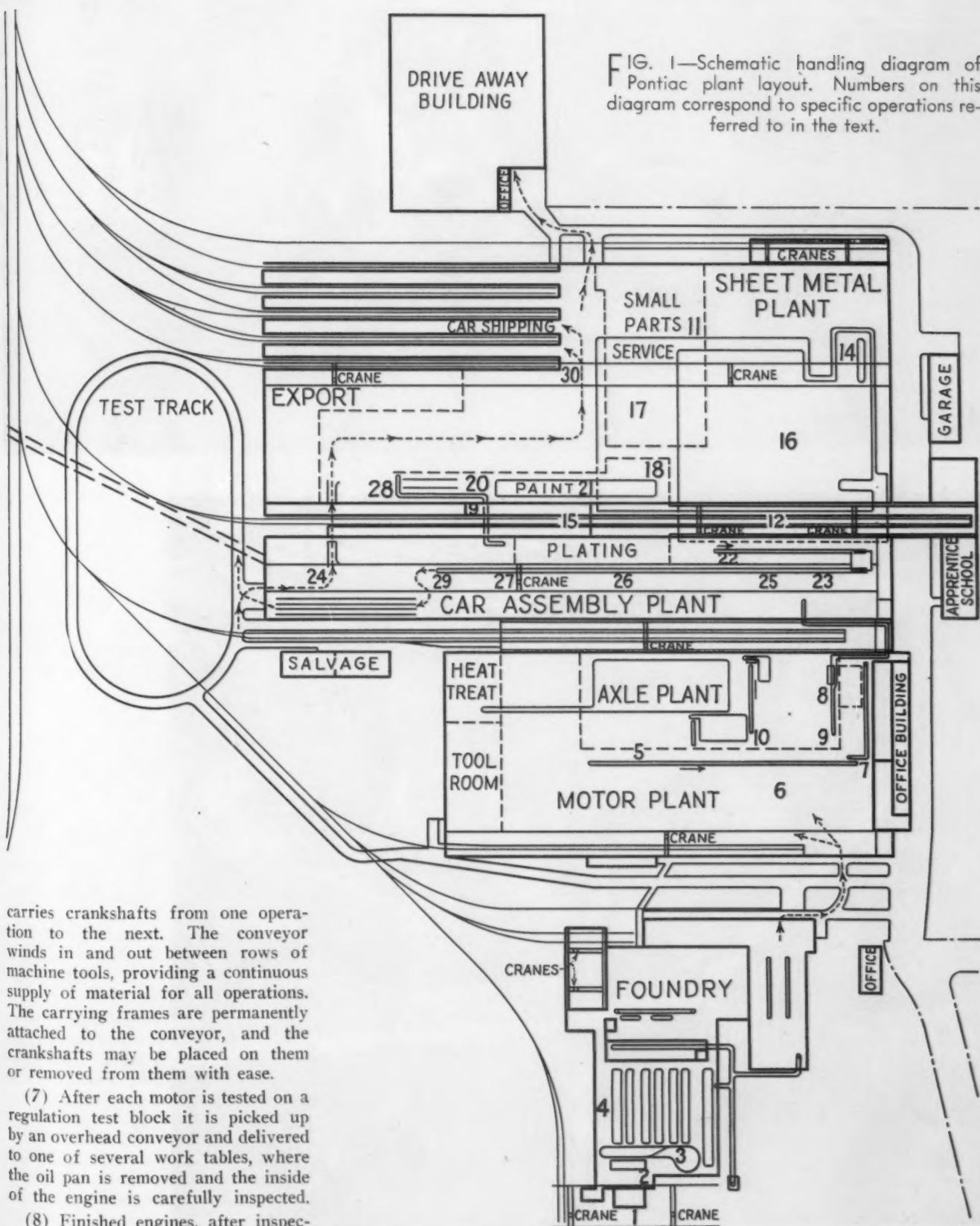
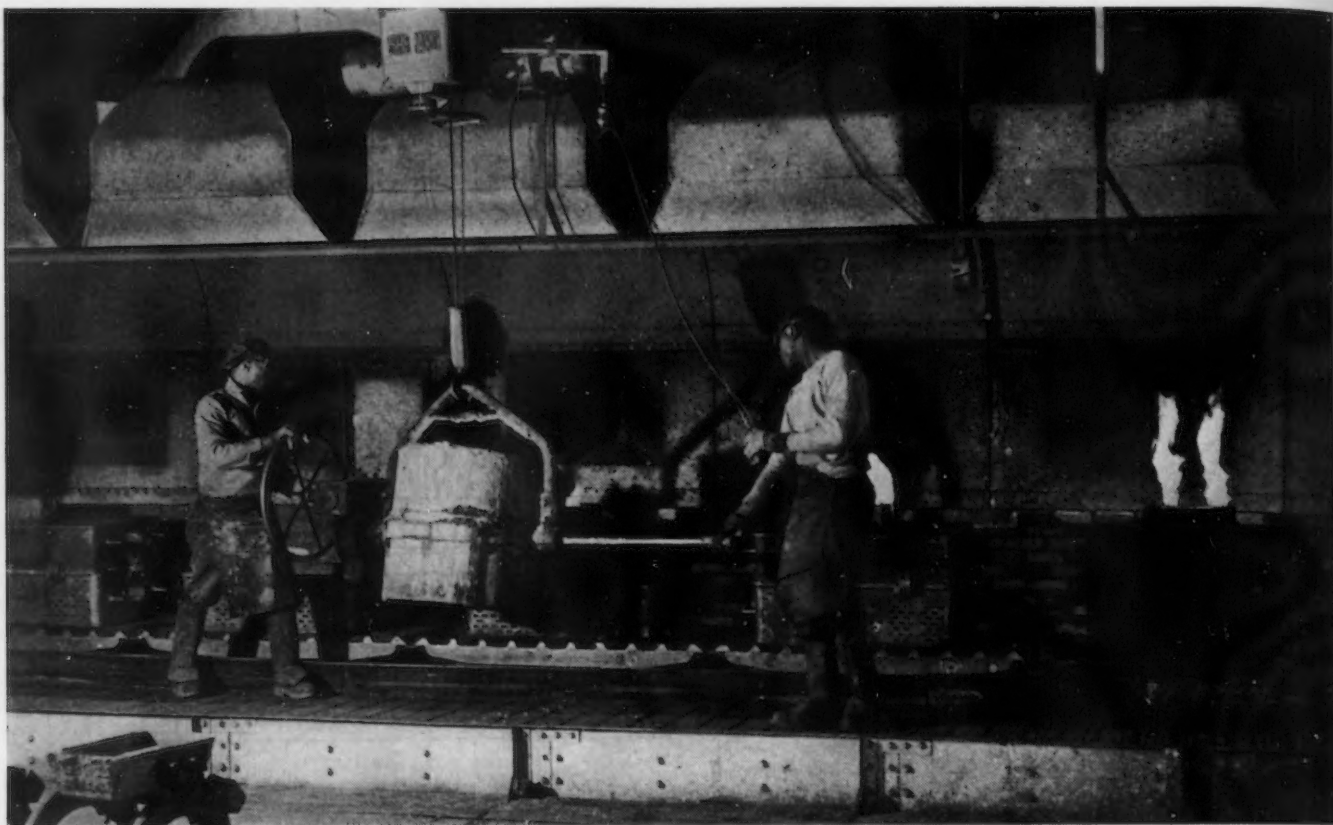


FIG. 1—Schematic handling diagram of Pontiac plant layout. Numbers on this diagram correspond to specific operations referred to in the text.

carries crankshafts from one operation to the next. The conveyor winds in and out between rows of machine tools, providing a continuous supply of material for all operations. The carrying frames are permanently attached to the conveyor, and the crankshafts may be placed on them or removed from them with ease.

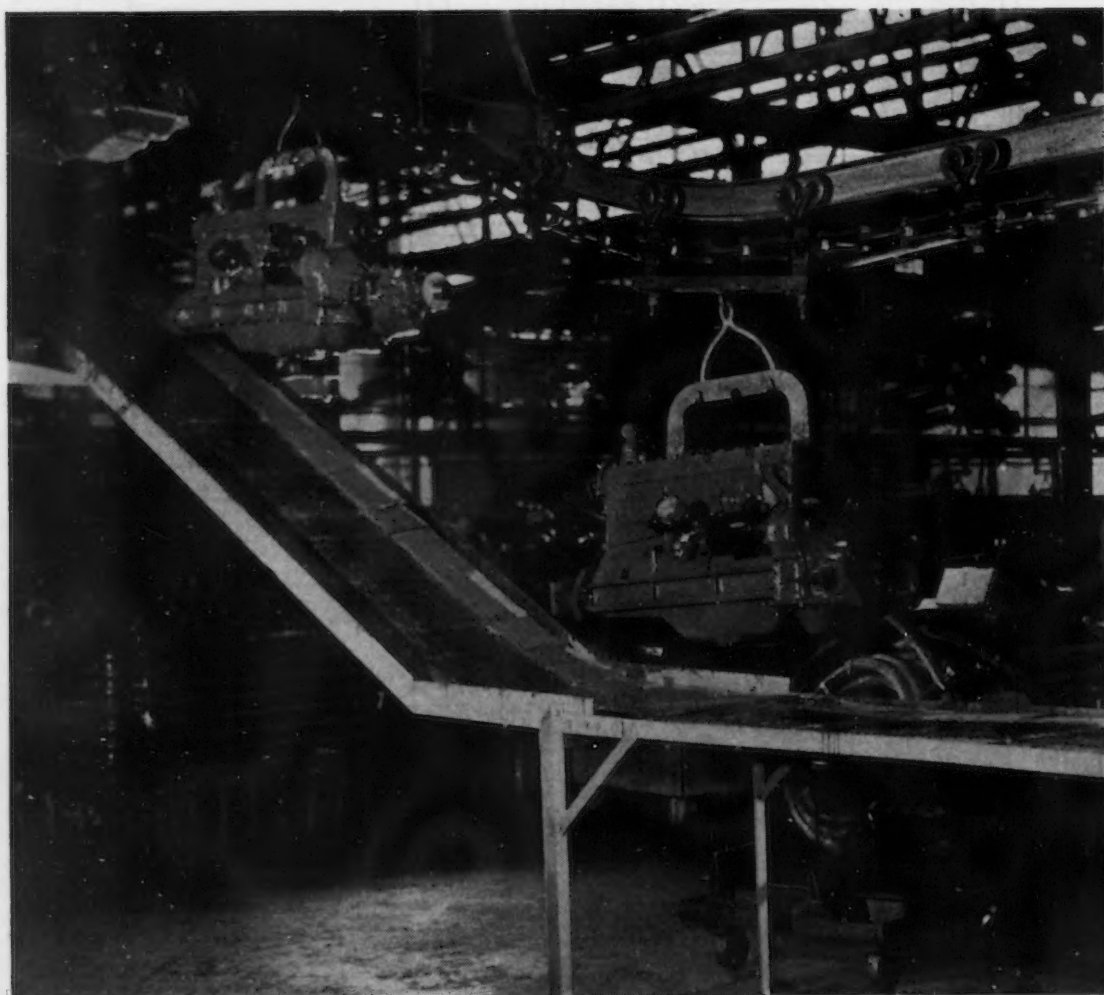
(7) After each motor is tested on a regulation test block it is picked up by an overhead conveyor and delivered to one of several work tables, where the oil pan is removed and the inside of the engine is carefully inspected.

(8) Finished engines, after inspection



ABOVE
FIG. 2—Pouring
metal into engine
block molds.

• • •



AT LEFT
FIG. 3—Deliver-
ing engines to
main assembly
line.

tion, travel on an overhead conveyor into spray booths, where they are completely spray-painted with an enamel which is baked at 350 deg. F. as they move along on the way to the master assembly line.

(9) Here is the finished engine (Fig. 3), completely painted, being carried over the rail and truck unloading docks in the final assembly plant.

(10) An overhead conveyor carries a special fixture on which a set of matched drive pinions and ring gears

(13) Five-ton low-lift industrial trucks deliver springs in skid-loads from the dock to the chassis assembly line. These trucks are very flexible in operation and can be turned almost on a thin dime.

(14) Fenders come from the forming presses to an oval track along which moving cars travel. Each car has a wooden buck mounted on it to hold a fender. Workmen grind off rough spots as well as seams of an electrically welded side-piece, while the cars move along the track and the

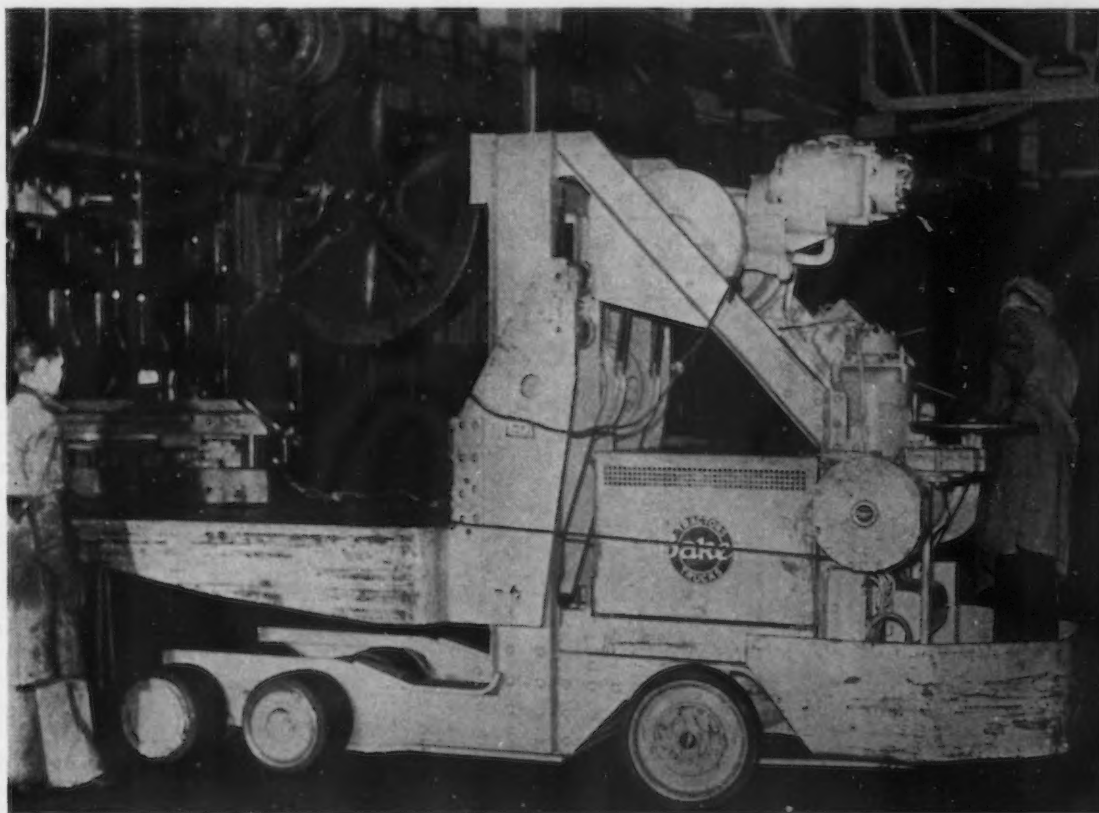
carry two loaded skid boxes at a time, filled with miscellaneous small parts.

(18) Fenders and other pressed metal parts are carried on hooks suspended from overhead conveyors through the spray painting booths.

(19) For moving heavy machinery or other loads beyond the capacity of the regular industrial trucks, Caterpillar tractors are used at this point.

(20) A special type of overhead conveyor is used at this point to carry pressed metal parts such as fenders, gas-tanks, hood sections and similar

FIG. 4—Handling dies on forming press with trucks.



for each axle is transferred from the gear matching department to the rear axle assembly line.

(11) Small parts which cannot be handled conveniently in other ways are loaded into skid-boxes and moved by 3000-lb. capacity high life industrial trucks.

(12) Here an overhead traveling crane unloads chassis frames from railroad gondolas run alongside under-cover docks. A special cradle has been designed for frame handling. As shown on the schematic plant layout diagram (Fig. 1), on either side of the master assembly line, railroad and truck loading and unloading docks run into the building, under cover. No loading or unloading operations are carried on in the open.

portable grinding tools move along the overhead monorail track which carries them.

(15) Tractor and trailer trains are used for handling incoming packaged materials directly from railroad cars or trucks to temporary storage.

(16) Specially designed 25-ton high-lift industrial trucks move dies from the tool and die departments to the heavy forming presses (see Fig. 4). The bed of each truck can be set at the exact elevation of the bed of the press, and each truck carries its own winches and cables to draw the dies on or off the press bed.

(17) High-lift tilting-fork type industrial trucks are used to stack skid boxes of small parts in tiers, or to

items from the stamping and press department through the spraying and finishing operation and thence to the final assembly line.

(21) Fenders, suspended from a steadily moving overhead conveyor line, pass through a spray booth where they are painted as they travel along. A powerful suction system draws off all excess spray and enables the workmen to work without masks.

(22) The start of the final assembly line begins at this point. A chassis frame is lowered onto a traveling chain conveyor, which does not end its journey until the car is finished. At the next stations axles and wheel hubs are mounted on the chassis, then—

(23) The engine is dropped into place and fastened to the chassis

frame, followed by the transmission box, and the driveshaft.

(24) Meanwhile, on the mezzanine floor above, bodies have come in from a Fisher body plant, and, set transversely across this chain conveyor, travel past various work-stations where the interior wiring is added, and work is done on instrument panels, heaters, radios, etc.

(25) At the end of this mezzanine line, the body is dropped down onto the chassis on the main assembly line below (see Fig. 5). Note particularly here the special handling rig swathed

grilles. Two welders work inside the table and four outside. The other workmen place the chromium-plated pieces in position in the welding jigs.

(29) A pit in the assembly line enables workmen to make final adjustments in the running gear before the completed car moves off the line.

(30) And finally, the completed cars are loaded for rail shipment, the loading of course taking place under cover. The latest type of Evans car loading equipment is used here.

The Pontiac plant is a complete manufacturing unit, covering 4,000,-

work in conjunction with the purchasing department in scheduling the receipt and storage of all incoming materials and parts; while inter-departmental handling of materials and parts in process comes under the jurisdiction of the material supervisors working jointly with the materials handling control staff and the superintendents of the various production departments.

The 13 overhead cranes are located as follows: Two to handle pig iron, scrap iron and scrap steel; two for handling foundry sand; one over incoming railroad tracks between the motor and assembly departments to handle materials for axle and car assembly; one over the full length of the master assembly line to keep stocks of parts replenished at all stations; two with special handling rigs between the sheet metal and assembly departments for unloading and storing chassis frames; one in the die department; two for unloading incoming steel for the sheet metal department; and one for export shipments.

More than 36,000 ft. of overhead, production line and miscellaneous conveyors include some 20,000 ft. in the final assembly line and in sub-assembly lines converging thereon. More than 9000 ft. of conveyors are located in the foundry, about half of this being overhead types. Roller tables are used to move heavy cylinder blocks and like parts between machines. Motors and final chassis and car assembly lines are heavy, endless chain conveyors. Small, miscellaneous parts are loaded in skid boxes and transferred by industrial trucks, or tractor and trailer trains.

The 99 industrial trucks and tractors are assigned regularly to different departments for daily use as follows: Car assembly, 24 units; foundry, 20 units; sheet metal stamping, 18 units; motor department, 15 units; maintenance work, 14 units; central stores and service parts, 3 units each; by-products and service manufacturing, 1 unit each. With these power trucks are used 3000 skid boxes, 3000 skid platforms, 600 trailers for use with the tractors, 100 sand hoppers, and 200 special racks for foundry cores.

All together, this equipment comprises an internally operated transportation system of infinite complexity, but so flexible that it handles thousands of tons of materials and parts every day on schedules which permit of a true arterial flow continuously and progressively toward a single objective—a finished automobile rolling off the line every minute of the working day.

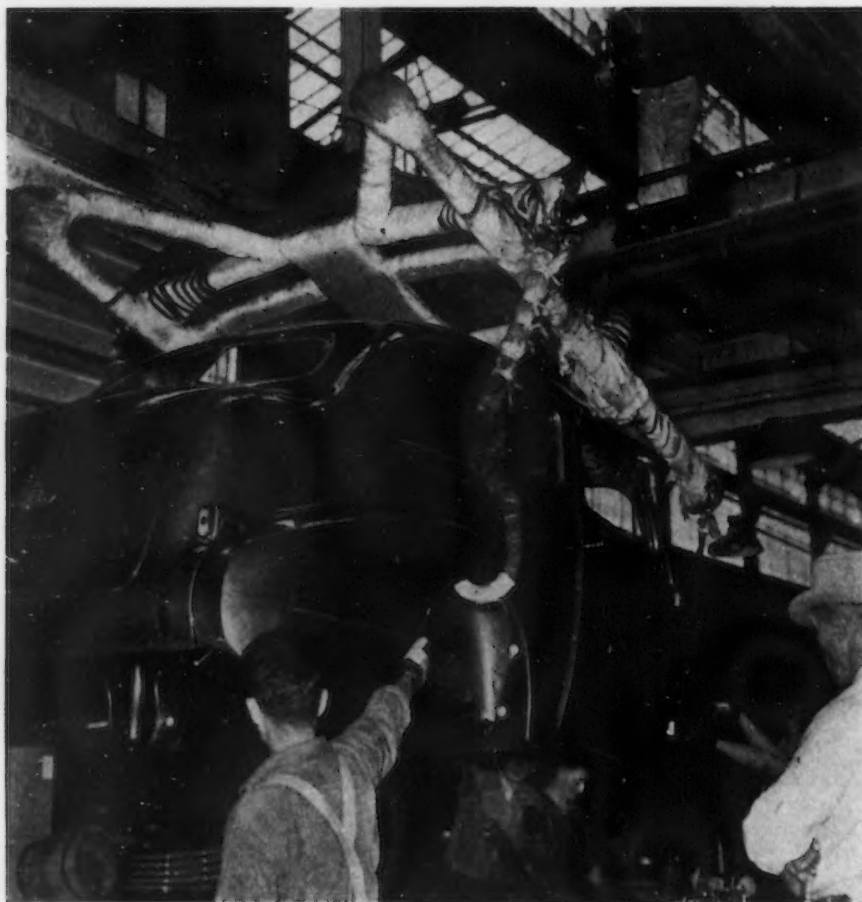


FIG. 5—Dropping body onto chassis frame.

with cloth to protect the finish of the body. This rig is suspended from an electric hoist.

(26) The body is fastened to the chassis frame, on the master assembly line.

(27) Several workmen work together on the job of fastening the body and various other finishing parts to the frame, as the whole job keeps everlastingly moving along.

(28) Around a circular table a hydraulic electric spot-welding process is used in the assembling of the radiator

000 sq. ft. of floor space on 231 acres. From the standpoint of materials handling equipment, the breakdown is one containing, broadly, 13 overhead traveling cranes, 99 industrial trucks and tractors, and over 7 miles of conveyors, together with auxiliary equipment.

Maintenance of this huge amount of materials handling equipment comes directly under the plant engineer. Its operation, however, is controlled by a materials handling department staffed with a number of clerks who

Continuous Mills

SUGGESTIONS FOR INCREASING THE FLEXIBILITY OF SMALL SECTIONS AND MERCHANT BAR MILLS . . .

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THE market that is today facing the steel industry is not only one of greatly diminished tonnage but also one of changed requirements. Whereas yesterday a slump in the market meant only a period of temporary retrenchment, the market of today is one in which the greater volume of smaller orders and the more exacting requirements with respect to the quality of the steel, finish, etc., have radically affected the economic operation of existing rolling mill installations. Nowhere is this more particularly true than in the field of merchant bars and small shapes, the greatest outlet of steel tonnage with the exception of sheet and strip.

For many years all developments of rolling mill design and technique have been accomplished with the principal thought in mind that the more highly specialized the plant designed the more economical the operation thereof. It was because of this as well as of market demands that the flexible three-high hand and guide mills gave way, wherever possible, to the continuous type. That these economies are very real is unquestionable, provided that there is a sufficient tonnage of a uniform nature to keep the mill rolling. However, in order that the installation can properly earn a return on the investment involved it must work as regularly as possible, so that idle plant expenses can be kept down to a minimum. With today's diversified type of market this is a very difficult condition to satisfy.

It would seem that in the field of small sections and merchant bars a return to the older types of mills would be in order. Nevertheless the pure continuous mill (as distinguished from open or cross-country types) has certain technical advantages to warrant studies regarding its possibilities in adapting it to a market composed of small individual orders.

In brief, the advantages of continuous rolling are as follow:

(1) Rolling temperature can be much more closely controlled, and the temperature range is narrower.

(2) Loss in scale is lower than for the ordinary three-high or looping mills, inasmuch as the billet exposes a much smaller surface to the air during the working period.

(3) Efficiency, both as regards power and pass utilization, is higher, inasmuch as all the passes are working at full capacity; whereas in the three-high mill for much of the time that the finishing stand is rolling out, the roughing stands are running idle.

(4) Longer billets and continuous furnaces permit longer lengths to be rolled with fewer crop ends and shear losses. It goes without saying, of course, that the use of the flying shear frees the billet from any dimensional limitations imposed by the size of the cooling beds.

(5) Labor costs are lower.

As against the advantages just mentioned, the following disadvantages may be enumerated:

(1) Higher first cost with consequent greater earning power required to properly amortize it.

(2) A complex and expensive drive.

(3) Inflexibility as to the range of products that can be rolled from a particular installation. The three-high mill can roll practically anything within the range of the continuous mill with far lower costs for setting up.

(4) For every single pass required in the schedule of passes, a complete stand is required; whereas in the three-high mill a maximum of six or seven stands will handle practically every section the operator may be called upon to produce.

(5) As a corollary of (4), the number of rolls to be stocked is enormous, representing a sizable part of the capital investment in a continuous mill.

(6) The close interdependence of pass areas and rolling speeds brings with it the necessity of a very high order of skill in adjusting the mill for properly rolling out an order.

(7) Finally, the necessity of working the metal on all surfaces requires the use of twist guides, already difficult to handle for bar sections, but even more so if the sections in question are light shapes. A large portion of the scrap loss in continuous opera-

tions is due to twist guide troubles, cobbling, insufficient cooling, etc.

Continuous Mill Cheapest

For purposes of determining the actual cost of an installation, the guiding factor should be an analysis of the fixed charges required to amortize it over a period of its useful life rather than a mere summation of the first costs. Into these figures there will then have to be entered both labor charges and maintenance items as well as the original capital investment. When an analysis is made along these lines for a three-high mill, as compared with a continuous mill, both of the same potential capacity, the actual cost of the latter becomes the lesser despite its higher investment worth. Another way of stating this would be to say, that granted a full utilization under all varying market demands, the continuous is the cheapest. Thus stated, the problem becomes one of a strictly technical nature calling for the design of a mill which while fulfilling the prerequisite of overall cheapness of cost shall also satisfy the demands of sufficient flexibility.

The first requirement of flexibility is to lay out the installation as a whole in such a fashion as to reduce to a minimum the time and labor required for roll changes. This of course includes the time consumed in running through test bars and making final adjustments to the passes. The sequence of the passes involved in rolling the range of program planned must therefore be studied as a whole, so as to utilize as many as possible common passes in the various roughing and strand operations preparatory to finishing. Although theoretical refinements as to maximum permissible reductions will be sacrificed in individual instances, the savings resulting as a whole when considering the number of roll changes eliminated will more than offset them.

Keeping in mind as cardinal that an absolute minimum of roll changes is basic, it is possible to go further and examine the possibilities of eliminating as many as possible of the roll changes in the finishing stands. Here a logical adaptation of the three-high practice of embodying a number of finishing passes in one set of rolls can be considered. Inasmuch as the axis of rolling is in a straight line, the alternative to placing the guides in front of the correct pass can be reversed by moving the stand crosswise so as to aline the desired pass with the rest of the mill. In order to do this the mill housing should be mounted on an inter-

mediate bed, similar to a lathe bed, with properly planed V-ways, upon which the entire stand can be pushed along. It is of course to be understood that the stand shifting operation would be motorized, otherwise the time saved in roll changing would be entirely lost in the time consumed in cramping a heavy set of castings on rails.

In line with the above suggestions there arises the question of guides. Guides, at best, are troublesome—while in the case of twist guides, the time consumed and the endless perversities displayed can undo all the savings effected in other phases of the rolling operation. It is here that a properly designed vertical mill can simplify the problem to no mean degree. It should be no more difficult to construct and operate a continuous train composed of alternating horizontal and vertical stands if the peculiarities of the design are recognized and allowed for. The early

Bedson mills of the 1870's rolled very successfully when new, but soon developed difficulties in the drive of the vertical stands, which being located in pits beneath the mills, were subject to the destructive action of scale and water. The apparent impossibility of solving this problem led to the conversion to the Morgan type with twist guides substituting for the original vertical arrangement. It would be possible today to design a satisfactory bottom drive for the rolls, capable of excluding the scale and water, although the inaccessibility of the mechanism for inspection and repairs would still present a serious problem for general maintenance. On the other hand a top drive automatically solves all these difficulties, while setting up a more cumbersome arrangement of shafts and gears to interfere with expeditious roll changes.

There is little reason why a properly proportioned worm drive couldn't be





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A BAR mill of this type has great flexibility in handling a variety of orders. Initial cost is comparatively low, and driving mechanism is not so complex as in continuous types of mills.

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used, in which the worm gear was of a greater diameter than the rolls. The roll changing procedure would be to uncouple the roll from a short spindle passing through the hub of the wheel and then sliding the entire worm assembly crosswise, thus leaving the roll free to be lifted out directly by an overhead crane. In this instance, also, this operation should be motorized for time saving purposes. Inasmuch as the basic point of this suggested design is to offset the axis of the roll with respect to the drive, the use of an offset bevel or hypoid gear would be equally feasible. A further point in the design of the stand should be to make the vertical housing an adjustable sub-assembly within the mill frame so that the required pass can be vertically aligned with the rest of the mill.

The drive is always far more complex than that of the regular three-high mill, but even here proper advantage of the possibilities afforded by

the design can be taken. The first question facing the designer is whether to drive each stand individually or to combine the drive of several or possibly all stands by means of reduction gears to one large motor. While the use of the single motor simplifies the electrical problems involved in synchronizing several individual motors, the loss in flexibility as to freedom in pass design because of fixed gear ratios should not be overlooked. Undoubtedly the greatest freedom in rolling technique can be realized when all the stands are individually driven, and even here, by the use of a full Ward-Leonard control in preference to one of the a.c. systems.

It might be possible to go one step further and eliminate the pinions by driving each roll separately. This practice, although applied to date only in the case of very large blooming mills, where the size of the electrical units involved precluded the use of a single

motor, offers some very interesting possibilities. First, a slight difference of speed between a pair of rolls might considerably simplify pass design when considered from the viewpoint of the various peripheral speeds of different surfaces of the section under design. It would relieve the designer of the necessity of laying out reductions with as strict an observance of draft, tearing action, etc.

Furthermore, when sections such as very flat ovals and band ovals are being rolled, it might be possible to work out a rolling technique in which the top roll is friction driven through the combined action of the piece and the pressure of the screw-downs. This would permit any slight irregularities in the passes themselves to compensate without unduly tearing or stretching the surface of the section. It should be borne in mind that the complete elimination of the pinions eliminates one of the larger items of expense connected with an installation of this character, even though the number of electrical units is increased. Furthermore, problems of installation, cooling and enclosure are considerably simplified by the reduction in size of the motors. With such a drive, some very interesting refinements in control are possible, making the mill more capable of meeting quality requirements.

Automatic Controls Desirable

The operation of rolling is fundamentally governed by two factors—temperature and rolling pressure. All other conditions and adjustments to be made during the work are merely subsidiary to the maintenance of these two factors, regardless of the amount of time or care consumed in their realization. The temperatures involved are dictated by the metallurgical qualities of the particular metal being rolled, as well as by the sectional area and the amount of exposed surface. The pressure required shall be such as to work the metal beyond the elastic limit but less than the yield point. A system to control that would permit the operator to concentrate entirely on these two factors and relieve him of responsibility in the matter of other phases of mill operation would therefore appear to be a most welcome adjunct to the art of rolling. In order to achieve this, it is necessary that all other conditions affecting rolling operations be controlled automatically. These conditions are briefly as follow:

- (1) The product of the section area and the velocity must be the same for all stands in a continuous mill.
- (2) The rolling pressure must be

kept automatically at whatever may be the selected setting.

(3) Tension, if required, must also be regulated without attention on the part of the operator.

The first condition embraces the principal problem mechanically of continuous rolling. In early installations difficulties arose as soon as wear either of the passes or in the roll necks and brasses destroyed the original calculated relationships. This, however, was overcome by setting the various stands at speeds definitely greater than the theoretical requirements. The cumulative increments thus established set up a definite tension in the material, within elastic limits of course, and in this fashion compensated for irregularities in the correct pass area-speed relation, resulting in some additional power over and above that expended in actually working the metal. Fine adjustment was, and still is, taken care of by adjusting slightly the clearance of the rolls through wedges under the bottom roll chocks, the top rolls remaining fixed. Although in practice the system responds perfectly well, it carries with it the requirements of a very high order of skill and continuous vigilance on the part of the roller. However, by taking advantage of the fully motorized drive discussed earlier in this article, the entire problem of pass areas and rolling speeds can be solved in an automatic and self-correcting manner.

Roll Pressure Proportioned

If there is assumed a metal of uniform characteristics and there is likewise assumed a uniform rolling temperature, the amount of work necessary to effect a certain predetermined reduction in section will be constant. In other words, the power requirements and rolling pressures will be constant. Therefore, it follows that, within practical limits of course, pass area and bearing wear can be controlled by maintaining a predetermined rolling pressure. Pressure sensitive units can be inserted between the screw-downs and the breaker blocks to measure the effective rolling pressure in terms of electrical resistance.

If the pass springs slightly or the entire roll setup shows some "looseness" in operation, the resulting play will be measured in terms of reduced rolling pressure, rendering an adjustment of the screw-downs necessary to restore the rolling pressure. This action can be rendered automatic by linking the pressure units and the screw-down motors in a common potentiometer circuit. Furthermore, for greater

precision, the pressure on each roll neck should not be the same, but rather they should be proportioned by considering the roll as a beam with a concentrated load at the axis of the pass. In this manner parallelism of the rolls can be better maintained, inasmuch as the moment arms involved will balance. Inasmuch as the pressure reaction at the necks is a function of the power delivered by the drive, it would likewise seem feasible to incorporate a speed control of the mill as dependent upon the pressure requirements.

Automatic Speed Relationship

The speed relationships between the various stands can be automatically maintained by a device similar to those in use in the paper industry. Taking the speed of the finishing stand as the given independent, all other stands will be properly adjusted against it as a reference. Rather than attempting to maintain a set speed ratio, and thereby either stretch the metal or allow it to slack, the better method would be to permit the metal itself control the speed of the various stands. A suitably designed friction roll attached to the end of a swinging arm would rest on the metal as it travels between the stands, this arm being loaded either by a spring or weight so as to attempt to loop the piece if it should slack between two subsequent passes. This swinging arm action would operate a selsyn device telemetered to the speed control of the stand preceding it. Now, if the speed ratio between the two stands is correct, the arm will be neutral; if, however, the preceding stand rolls out faster than the subsequent stand can receive the metal, the slack resulting will be followed by the arm, and this condition telemetered to the speed control of the preceding stand reducing its speed and thereby restoring the proper ratio. This, it will be noted, will be the correct ratio for the instantaneous conditions as required by the conditions of the passes, rolling pressures, etc., and not an attempt to restore any absolute value. In order to prevent the opposite condition—excess tension—the stands when being started can be deliberately run at such speeds as will produce a slack condition, whereupon the mechanism will adjust to correct conditions.

With the apparatus as just described, or of a nature to accomplish the same purposes, combined together with the individual motor drive, the roller will be relieved of practically all mechanical problems connected with the mills in operation, thereby being

able to devote himself more exclusively to the product itself.

It is, of course, understood that the mills themselves should employ in their construction standards of manufacture similar to those practiced in the machine tool industry. Inclosed pressure lubricated bearings, either of the anti-friction or pressure sleeve type are imperative, so as to substantially reduce the power requirements, as well as to maintain roll setting unaffected by wear. It might appear that an installation as described carries with it an undue number of motorized auxiliary functions, but it is precisely in this that the flexibility of the three high-mill can be equalled while retaining the advantages of the continuous mill.

Inasmuch as the functions to be performed are intermittent and of slight power requirements, the motors will be small units reasonable in cost and space required. Undoubtedly the increase in installation cost to embody this feature would be more than compensated by the advantages derived from their use. However, with the exception of the vertical stands, such mills would not differ radically in design or construction from existing types. In one respect, however, there will be a marked difference, namely, the limiting torque of the rolls. Inasmuch as the feature of several passes for a pair of rolls will make the rolls longer in body than the present day bullheads now used in continuous mills, the limiting torque to prevent snapping will be lower. Possibly the use of cast steel rolls will overcome this deficiency; nevertheless, in balancing the advantages of fewer roll changes against the increased strength of bullheads, the former arrangement appears to be the more favorable one. The question can only be answered by actual experience in the field. Before closing on this point of the rolls it should be noted that the suggested type of rolls would cut down greatly on the investment in rolls stocked.

Conclusions

The writer believes that a mill designed more or less according to the suggestions set forth herein should go a long way toward solving the knotty problem of flexibility while losing none of the technical superiority of the modern methods of continuous rolling. The problem has been solved for the field of sheet and strip, and there seems to be no reason why the same advanced technique cannot be applied to merchant rolling, an outlet which is today still one of the largest consumers of the blast furnace's product.

NICKEL PLATING IMPROVED

NICKEL deposited from a nickel chloride-boric acid solution is finer-grained, smoother, harder, stronger and somewhat less ductile than soft deposits from the ordinary sulfate electrolyte, according to a report prepared for the recent Columbus meeting of the Electrochemical Society by W. A. Wesley and J. W. Carey, of the International Nickel Co., Inc. Tested in the as-plated condition, coatings from the two baths are of about equal protective value when of equal thickness.

The results of laboratory tests indicate that advantages which can be obtained by electroplating from the chloride solution instead of from the sulfate bath include the following: A 50 per cent reduction in tank voltage and power consumption, ease of control due to simple composition, wide plating range, high anode and cathode efficiencies, lower susceptibility to pitting, smoother and tougher deposits, less tendency to form nodular growths and trees on thick deposits, and production of coatings which are easier to buff. The principal disadvantage of the chloride bath is the greater corrosiveness of the solution. However, modern materials are available which can be used to overcome this.

According to the investigators, the maximum nickel content suitable for commercial operations without excessive drag-out losses is 75 grams per liter. Addition of boric acid as a buffer to the nickel chloride solution is necessary to provide a plating bath capable of producing good deposits under properly correlated conditions of bath temperature, pH and current density.

The accompanying illustration shows that with a bath temperature of 130 deg. F. sound deposits are obtained over a very wide range of plating conditions, cracked deposits being encountered only when a high current density and a high pH are employed simultaneously. Three types of appearance are presented by the sound deposits within the ranges of the variables investigated. All three are

considered good deposits. The descriptive terms "dark," "light," and "semi-bright" refer only to the as-plated surface appearance and are not to be construed as colors characteristic of the nickel metal.

A question which arises on learning of the advantages of the nickel chloride plating bath is: Why have not these advantages been discovered sooner and commercial use made of them? The answer is not obvious. Workers interested in refining nickel have never hesitated to explore the possibilities of a chloride electrolyte for this purpose. Perhaps the present use of sulfate electrolyte is chiefly due to the former lack of suitable materials of construction resistant to corrosion by the chloride solutions. Again, perhaps the worker interested in nickel plating has always been discouraged by the dark surface appearance of the chloride deposit. The refiner would pay little attention to this but much to the analysis of the product. Blum and Kasper sought the most ductile deposit possible, hence abandoned the chloride bath for electrotyping even though their work demonstrated a number of advantages of that bath over the sulfate solution. Waite also showed important advantages in high chloride baths, but the scope of his work was limited by an experimental procedure in which deposits were made at only one pH value of each solution studied.

The maximum voltage available with

commercial generators of the type used in electroplating establishments is 12 volts. If it is attempted to operate a large nickel-plating tank at capacity, that is, with the cross-section of the bath filled with work to be plated, the maximum current density which can be used is about 50 amp. per sq. ft. since this requires a tank voltage of about 12 volts. Under the same conditions the chloride solution would permit the passage of over 100 amp. per sq. ft.

The power cost can be cut substantially in half by changing over from the sulfate to the chloride bath. This cost is not considered an important factor in ordinary nickel plating as contrasted with refining. Nevertheless, the investment in generator equipment and its maintenance and repair are worth consideration even in the plating process. Power costs become more important when heavy nickel deposits are made, as in electrotyping, forming and building-up worn parts.

The greater smoothness of the fine-grained deposits from baths rich in chloride has been noted by several investigators. Qualitative tests made with the aid of a polishing lathe employing 6-in. polishing and buffing wheels indicated no marked difference between the dark matte deposits and the smoothest coatings from the sulfate bath but did demonstrate that the light matte and semi-bright deposits are much easier to polish. The semi-bright coatings 0.001 in. thick are so smooth that they are readily brought to a bright mirror-like finish without the use of cutting compounds and with only slight buffing on a soft rag wheel containing rouge.

The greater smoothness of thick deposits, lower tendency to form nodules, trees and built-up edges are attractive advantages of the chloride electrolyte for engineering uses such as electroforming and salvaging worn parts.

The composition of the chloride electrolyte is very simple, there being but two ingredients. The wide range of plating conditions under which sound deposits are obtained, the

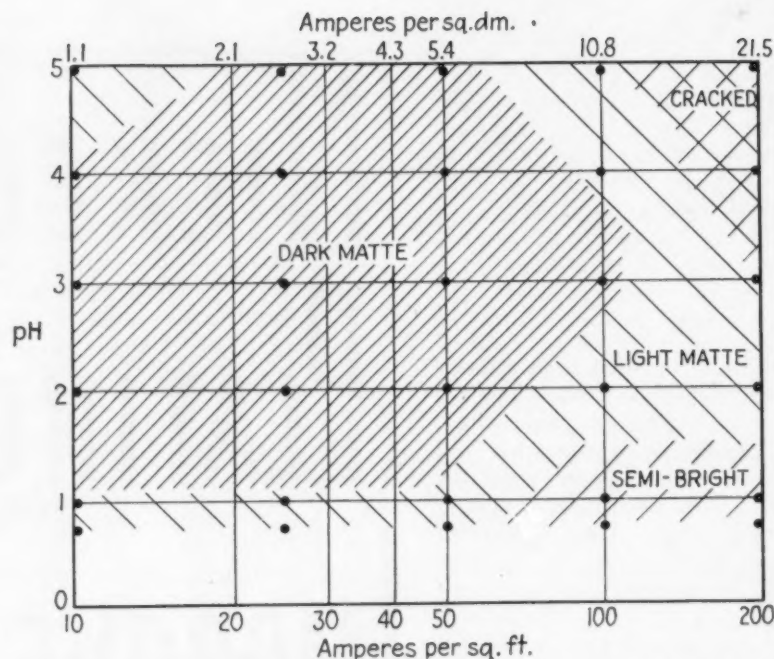
greater freedom from pitting and the high anode and cathode efficiencies all contribute to making this bath easier to operate and more nearly fool-proof than the sulfate electrolyte. Cleanliness is promoted by the fact that the chloride salts do not "creep" and form unsightly messes of green salt above the solution level.

It is possible that pitting will be encountered in operating large volumes of the chloride bath under commercial conditions but this has certainly not been indicated in the laboratory work. Additions of oxidizing agent are required to prevent pitting only in freshly prepared baths, whereas daily additions are always necessary in plating from the sulfate electrolyte under identical laboratory conditions.

The cathode efficiency of the chloride electrolyte is higher than that of the sulfate solution under all the conditions investigated.

The heat generated when it is attempted to operate a sulfate solution with large amounts of work at very high current densities is so great that it may be necessary to use cooling coils in the bath. This is being done, for example, in a tank in which bumper bars are plated at 90 amp. per sq. ft. in a commercial plant. This difficulty would not be encountered with a chloride bath until much higher current densities were employed.

The principal disadvantage of the



PLATING ranges of chloride bath at 130 deg. F. (54 deg. C.). The boundaries of the regions shown are only suggestive, since there is a gradual, not a sharp, change from one type of deposit to another. Each dot shown represents the conditions maintained in one experiment.

chloride electrolyte lies in the greater corrosiveness of the solution. Lead corrodes rather rapidly in it. A few years ago this would have been an overwhelming defect, but the present availability of rubber-lined steel for

tanks and pipe-lines, as well as rubber linings or hard rubber for other parts of equipment, diminishes its importance. High silicon iron can be used for pumps, heat exchangers and other cast parts.

No Furnace Required for Annealing Wire

NEW tricks making possible the continuous annealing of single strands of copper wire while racing through open gas flames at rates up to 1000 ft. per min. promise to "help to do away with long tedious annealing cycles in bulk," according to W. M. Hepburn, vice-president and chief engineer, Surface Combustion Corp., Toledo, who announces a test run of 10 to 20,000 lb. of wire just begun through new equipment developed jointly by his company and the Syncro Machine Co., Newark, N. J.

Essentially the apparatus consists of a long row of extremely accurately controlled gas flames—with positioning dies spaced along the length of the row so that the wire passes through just that portion of each flame in which combustion has advanced to the point where both temperatures and burning gas compositions are "just right" for the anneal. Adjustment is provided by the height and character

of the flames as well as by the speed of the wire along its flaming route. The unit now in operation uses a line of special gas jets 9 ft. long, although it is planned to boost this length to 27 ft. and step up wire velocities accordingly. The result will be multiplied production.

The mechanism for the spooling and unspooling of wire is understood to be quite ingenious. Further, all equipment is automatically regulated by the resultant anneal through a continuous, indicating "anneal meter" at the finish end of the unit. This gadget, according to reports, functions to "feel" the "texture" of the wire surface as it leaves the annealing burner.

"This new equipment can be used for annealing alone, or for annealing, pickling and coating (principally tinning)," indicates E. G. de Coriolis, research director for the Surface Combustion Corp., "in which case,

coatings are sprayed on as the wire flies by rather than applied by dipping. And only because modern gas combustion is susceptible to such nicety of control and constancy of predetermined flame characteristics is the development feasible."

Another dollar-saving virtue of the new apparatus, it is claimed, is that it results in a more uniform anneal than is attainable in batch and even many continuous operations. The general previous practice has been to anneal the wire in spools, necessitating a rather carefully controlled soaking period to produce uniform results from the surface to the core of the spool.

How widely continuous open-flame annealing will be applicable in wire mills cannot be predicted at this time, but it is expected to save considerably in equipment, maintenance, space, and time wherever the process is found practicable.

HOMER

SPLINE

LOCK

APOTENTIALLY new user of steel and a development which is a distinct forward step in the art of joinery are some of the claims made for the Homer "spline lock." This device is now being licensed to industry after a lengthy period of testing by H. R. Doughty, of 342 Madison Avenue, New York.

The "spline lock" can replace expensive tongues and grooves, dowels, nails, screws, dovetails, rabbetting, and lapping in woodworking, and is said to supplant these methods at lower cost in many applications, and at all times with increased structural strength.

The spline lock is applicable to wood, metal, tile, plastics, or any combination of them. The basic simplicity of the principle involved is shown in the accompanying illustration. Splines (or keys) are inserted in matched grooves of two pieces of wood, metal, etc., bending them in the desired face-to-face relationship. According to the kind of wood used, this method is said to yield three to ten times more strength in the joint than is obtained by ordinary means, thus reducing the art of joinery to its barest essentials but considerably increasing quality of construction at lower cost.

Tight Joint Possible

By decreasing the width of the grooves or by increasing the thickness of the metal, wood, or plastic splines, it is obvious that friction and tension are increased in direct ratio, even to the point where the two pieces being joined become immovable, in their relation to each other, if so desired.

There are many conditions, though,

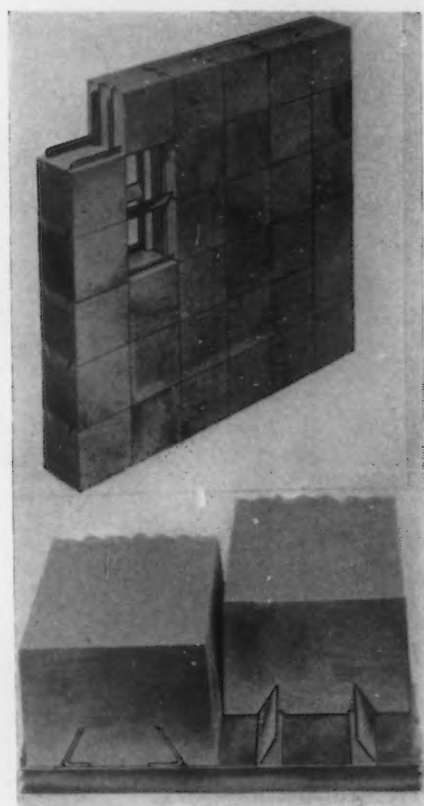
in which it is desirable to use the spline lock as a track or runway, utilizing fully its ability to act as an accurate guide and maintain any needed degree of even tension over a long or short length. Windows, drawer or table slides, and lathe "workholders" represent a few of these conditions in which its trueness and compactness make for increased economy and quality.

Production work is done with simple, moderately priced precision equipment obtainable through the licensor. Where it is necessary to make spline grooves on the job, this can be done with an inexpensive hand tool, also obtainable through the licensor.

Dead Weight Reduced

Block flooring units of hardwood with rigid, permanent edge-to-edge relationship are made possible through the use of the spline lock. These units are made with or without tongue and grooves. Because of the strength and tightness of the lock greater smoothness of floor surface is said to be obtained than in ordinary kinds on the average under-flooring or sub-floor. When laid by means of the regular spline lock (see illustration) the blocks are double-grooved on four sides to take the splines instead of tongue and grooves and blind nailing. This system not only is claimed to cut the cost of laying but also automatically levels the floor. These can be laid in any good mastic, as well.

Another use is in reducing expensive deadweight factors, one of which is represented in the new necessarily thick teak or fir decks of ships. It has been estimated that their weight can be reduced at least 25 per cent through



METAL splines, or keys, are used above to lay a wood block floor. Below is a somewhat different design of the spline for the same purpose.

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this method of bonding the wood to the steel under-deck. This also will mean additional savings in first costs—less lumber and reduced installation costs.

The spline lock also permits the production of a completely pre-fit window which can be sent to the job knock-down and assembled in a matter of minutes—jamb, head, sash and casing all matched grooved, with precision equipment and splines furnished for on-the-job assembly. No cuts or tool work required. The inherent weatherstrip qualities of the spline lock are utilized fully and provide a double track for each sash—giving a wood-to-metal relationship with minimum friction area. The angled double-spline lock and groove depth are gaged so that an expansion joint for sash and jamb is provided. Sash cannot stick or rattle because even pressure is exerted in the whole section at all degrees of humidity.



HHEATING bar stock prior to forging. Forging hammers range in size from 1500 lb. up.



FINISHING up a straight die block. In the foreground the operator is finishing up a solid type of die block. In the background, an insert type of die is being prepared.

FORGING AUTO

YEARs ago, F. J. Vlcek, president of Vlcek Tool Co., Cleveland, manufactured stone cutting and machinists' tools by the blacksmith method, but shortly after the birth of the automobile industry he foresaw the need for more and better tools. Today the firm supplies about 80 per cent of the tools for automobile kits.

The Vlcek production incorporates some highly interesting features. Samples of each order of steel are tested in the laboratory and the original lot order marked for production. The tools are made from chrome-molybdenum, chrome-vanadium and other steels supplied by Republic Steel Corp.

Dies for the forging operation are prepared by two methods, the solid die block and insert type of die block. By the solid method, the impression is cut into the solid block, which is heat treated and the temperature self-checked by the Hump method of tempering. The insert process is newer. The impression is first drop forged, then finished up by hand tooling, tempered and fastened in the insert holder, which becomes the die block.

When the dies are placed in the forging hammers, which range in size from 1500 lb. up, the steel bars are heated to 2200 deg. F. in oil-fired furnaces, and production of Vlcek tools gets under way.



UNLOADING, weighing and stock grading

TOKIT TOOLS...

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After the forging, the tools are conveyed to the coining shop and other departments for the finishing touches. Uniform thickness is obtained by subjecting the parts to 600 tons of pressure. The flash of the wrenches and similar tools is removed cold. Unique with Vlcek is the milling of both ends of open-end wrenches at the same time. In sections of the machine shop is found broaching, drilling and special machines designed for specific operations.

In the assembly department there are conveyors for monkey wrenches, machines for driving hammer handles into hammer heads, a conveyor that welds and assembles pliers, and other tools.

The company is now spending \$100,000 to enter the plastics molding field. With the advancement into plastics, the company will extend its operations in the automobile industry and the general trade fields. Formal announcement as to the line of products will be made later but the first step has been taken with the purchase of a large plastic injection press and other plastic molding presses.

Officers of the company are: F. J. Vlcek, president; E. C. Koster, vice-president; H. F. Vlcek, treasurer and metallurgical engineer; and D. E. Wilson, secretary.



BROACHING double end or panel bar wrenches. The Vlcek company produces around 80 per cent of the tools for automobile kits.



OPEN end wrenches are milled at both ends at the same time. These wrenches are one of the big production items.



and stock. Incoming steel is labora-
tory graded.

VARIABLE SPEED UNITS LEAD IN

AUTOMATIC speed control of variable speed drives, some within very close limits, is being offered by several makers of this type of drive in recent designs. A fully electrical drive has been developed to compete with mechanical and hydraulic types. Economic factors had to be solved before an old electrical principle could be put to work in low horsepower units. Several improvements have been made in variable pitch V-belt drives and in the belts themselves, including the use of oil resisting neoprene. Other power transmission equipment highlighted in this review of recent announcements include couplings of various types and ball bearing pillow blocks and pulleys.

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PRE-SET speeds can be held within $\frac{1}{4}$ per cent of desired value regardless of changes in load, voltage, frequency, speed of drive, oil temperature or running fits in the new type DT precision speed control transmission developed by the Oilgear Co., Milwaukee. In all fully hydraulic systems, departure from the set speed is caused by leakage of oil past the running fits due to changes in viscosity or wear of parts. The principle of the DT precision control is that the hydraulic motor, driven by fluid power from a variable stroke

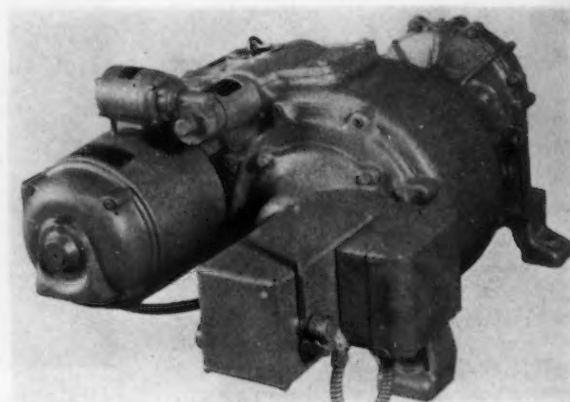
pump, simultaneously transmits the resulting speed back to a differential comparator. This differential also receives a standard or master speed from a small synchronous motor or a

pendulum (where line frequency variations are high) and translates any discrepancy in speed into the necessary increase or decrease of pump discharge needed to correct the error.

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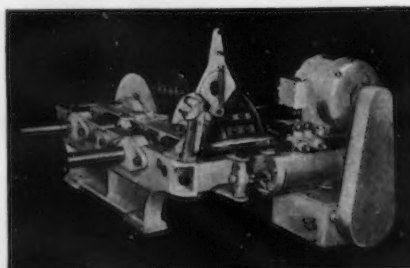
BELOW

NEW piston type hydraulic automatic control assembled on a horizontal open design of Reeves variable speed transmission. Connection to that part of the machine from which indication of required speeds can be taken is by cable or chain attached to the upright lever shown in the upper central part of the photograph.



A SMALL a.c. pilot motor actuated by a follow-up control gives automatic speed control to this Sterling 3-hp. Speed-Trol with a 4:1 infinite speed variation in combination with a 30:1 type B Slo-Speed gear reduction, giving output shaft speeds of 60 to 15 r.p.m., from an 1800 r.p.m. motor.

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Fluctuations of speed due to ordinary load changes are caught and corrected within about $\frac{1}{10}$ sec. Over a period of 10 sec. or more the integrated error is not measurable by a stop watch.

The various units of a continuous rolling mill or other processing machine may be driven by a group of Oilgear precision drive units, one unit acting as a master control of the others or each unit acting as master to the unit next in sequence. In either case, the speed ratios or draws between the successive units are individually adjustable and all units in the group will increase or decrease their speed in proportion to changes in the master speed. Another characteristic of the drive is that it cannot be overhauled by a decelerating inertia load, so that it is useful for winders and unwinders. Heavy rolls of material can be stopped and started without sag or added strain in the web.



THROUGH a self-correcting differential comparator, output speed of the Oilgear type DT precision hydraulic variable speed drive can be held within $\frac{1}{4}$ per cent of the selected value. Motor, variable delivery pump and hydraulic motor are built into a compact unit with all the controls.

AN improved type of hydraulic automatic control for use with its variable speed transmission is an-

RECENT POWER DRIVES

By FRANK J. OLIVER
Associate Editor, *The Iron Age*

nounced by the *Reeves Pulley Co.*, Columbus, Ind. This control makes possible synchronization of different machines and separate sections of a single machine, or maintenance of



ABOVE

VARIATIONS in the output speed of the Lenny electric drive are secured by changing the relative positions of two friction disks mounted at right angles to each other. The design is such that contact pressure between the contact roller and the driving disk is increased as the output torque increases. Made by Lenny Machine Mfg. Co., Warren, Ohio.

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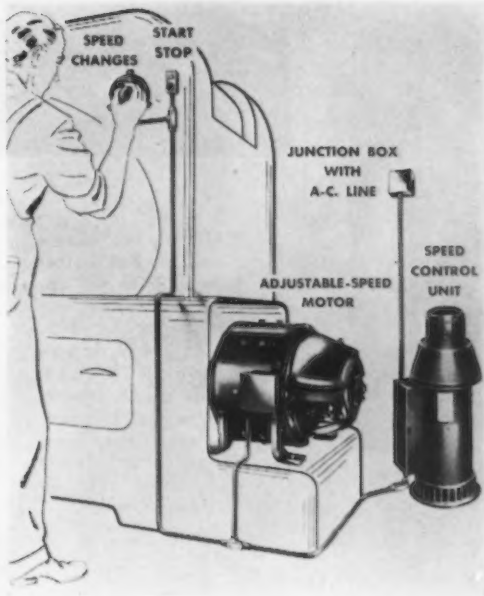
TYPICAL installation of the new Reliance V-S drive, giving simplified variable voltage control of the driving motor and across-the-line starting of the compact speed control unit, which operates on three-phase circuits.

uniform pressure, winding speeds, weight, liquid level, temperature and other variable elements.

This piston type of control is mounted on the end of the transmission, arranged so that the cylinder is connected to the right hand set of control levers for varying the effective pulley diameters and the piston is connected by a rod to the left hand set of shifting levers. Equalizing links insure equal movement of both pairs of levers. The self-contained hydraulic power plant, consisting of a motor driven pump and reservoir, is bolted to the cylinder housing, and a two-

way valve is also mounted integral with the cylinder. The valve, which directs the flow of oil to either side of the piston, is actuated by a rod connected to an extended lever above. This lever may be attached by cable or chain or direct to a compensating or floating roll, pressure regulator or any part of the driven machine from which indication of required speeds can be taken.

AN electric automatic control for much the same sort of application is announced by *Sterling Electric Motors, Inc.*, Los Angeles. In this



set-up the speed control lever, which may be connected to the indicating movement of the machine, actuates a follow-up electrical contact system, which in turn controls a small three-phase squirrel cage pilot motor. The latter through worm and wheel controls the handwheel shaft of a Sterling Speed-Trol variable speed unit which is hooked up with a motor driven speed reducer. Overtravel and hunting of the pilot motor have been eliminated. Follow-up contacts can be adjusted to give up to a maximum of 50 speeds within the range. Units can be furnished in various ratings up to 15 hp.,

with all standard gear ratios and with motors completely enclosed if desired.

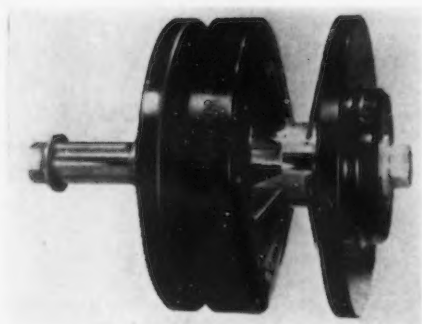
All-Electric Variable Speed Drive

PRICED competitively with mechanical type variable speed transmissions is a packaged all electrical drive recently announced by the *Reliance Electric & Engineering Co.*, Cleveland. Made in sizes from 1 to 15 hp., it brings to the field covered by such power requirements the characteristics of control heretofore available only in large size of electrical machinery. Speed ranges from 6:1 up to 12:1 can be had, depending upon the size.

The new drive consists of a control unit which may be plugged in three-phase, 60-cycle, 220, 440 and 550-volt a.c. circuits, and an adjustable speed d.c. motor. Essentially the control unit is a vertically mounted, high speed motor-generator set with integral exciter. Through the Ward-Leonard system of variable voltage control, speed control is effected through a simple field rheostat. Through push button control of the a.c. motor, the d.c. motor can be started and stopped without interfering with the speed setting. Quick stopping is obtained by regenerative braking. When the work calls for operation of the motor in



SELECT-O-SPEED transmissions with hand-wheel control for finer speed adjustments in sizes from 1½ to 7½ hp. are announced by the *Ideal Commutator Dresser Co.*, 1925 Park Avenue, Sycamore, Ill. This design supplements the standard line with lever control, made in fractional horsepower sizes up to 7½ hp. By replacing the handwheel with a set of bevel gears and extension rod, the point of control may be taken to a more convenient location.

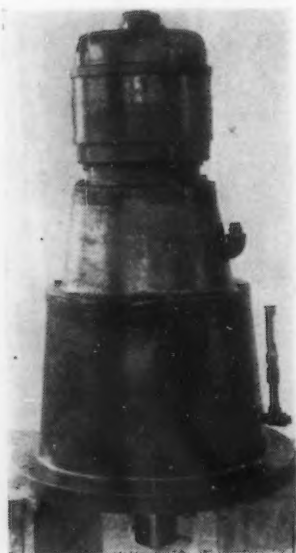
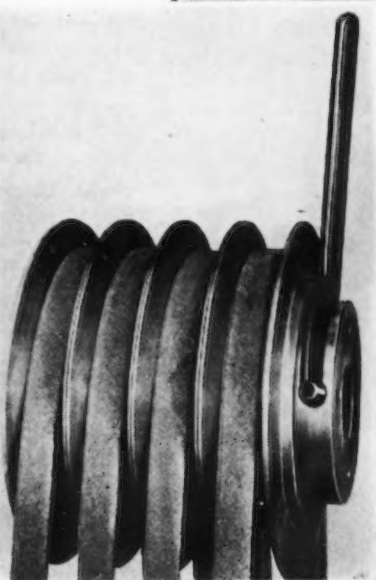


ABOVE

VARIABLE-PITCH pulley units for the Speedmaster drive are now made of solid bakelite of high impact strength, and a pressure lubricated bronze sleeve is provided for floating double cone. Interlocking slots in the pulley faces allow the V-faces to be brought close together for maximum pitch diameter.

AT RIGHT

AS the adjusting collar is turned on the new "American" adjustable diameter Wedgbelt pulley, the side walls making up each V-belt groove are regulated, increasing or decreasing the pitch diameter with corresponding speed changes. On type A groove pulleys, maximum speed change ranges from 22 to 33 per cent; on B pulleys, 18 to 25 per cent, and on C pulleys 15 to 20 per cent. By the use of adjustable diameter pulleys on both the motor and the driven shafts, greater speed variations can be secured. Both side walls making up a groove move in or out simultaneously, thus maintaining belt alignment. A product of the American Pulley Co., 4214 Wissahickon Avenue, Philadelphia.



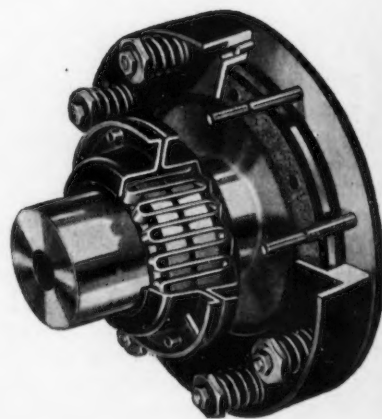
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NO. 40 VM WHS differential speed reducer employs a standard flange type, totally enclosed motor rated at $1\frac{1}{2}$ hp. at 1725 r.p.m. This particular model has an output speed of 5 r.p.m., although almost any ratio can be supplied in the same dimensions. Heat-treated alloy steel gears are used throughout. Similar types up to 75 hp. are also made by Winfield H. Smith, Inc., Springville, Erie County, N. Y.

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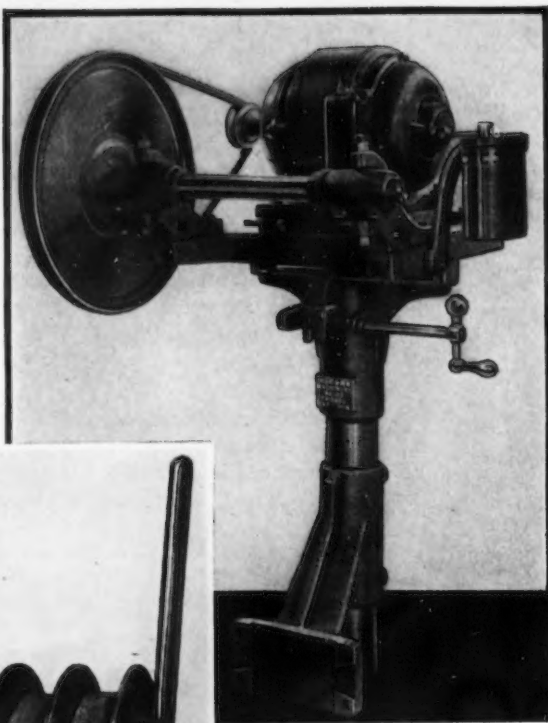
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PERMANENT alignment between both halves of the disk type friction brake is assured in the design of the new Falk controlled torque Steelflex coupling, intended to protect mechanical drive units from overload peaks.



BELOW

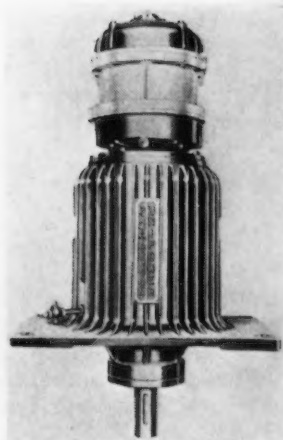
MODERN motor drive, now made by Quality Hardware & Machine Co., Chicago, is a conversion unit for application to cone head drive machines. The flat belt pulley or cone is mounted on the countershaft, but is not shown in this illustration.



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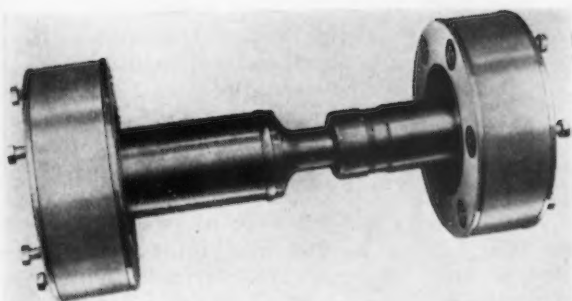
FOR cutting square ends on flat leather belts prior to the application of steel lacing, Armstrong-Bray & Co., 304 N. Loomis Boulevard, Chicago, is offering a moderately priced belt cutter, capable of handling leather, fabric and rubber belts up to 8 in. width.

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ABOVE

A RUGGED guide bearing built into the base to take care of the side load and unbalance of the mixer shaft is a feature of this Unipower agitator drive, which has been redesigned and put on a production basis by its maker, the Patterson Foundry & Machine Co., East Liverpool, Ohio. This new unit is equipped with anti-friction bearings, widely spaced, and the spiral type gears are hardened and ground. Gears and bearings are lubricated by means of dual plunger pumps, but the guide bearing in the base is pre-lubricated to prevent leakage into the product being handled. The drive is built in sizes up to 50 hp. and in many speeds.

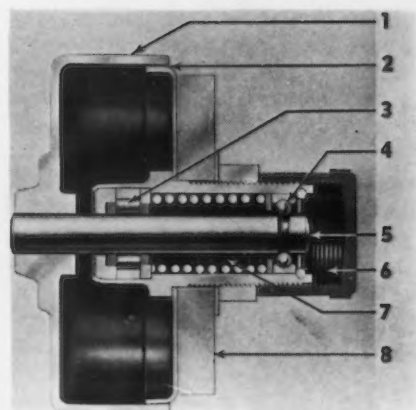


THE Moreflex radial coupling drive shaft combines the features of the standard Moreflex radial coupling (described in the text) in a slip joint drive shaft for added flexibility or where a remote drive is required. The slip joint is full spline construction, grease tight. The forged shaft members are piloted into the coupling hub members and welded in place. The short coupled drive is made in one standard length; for long coupling, tubing is added to suit. Both types are made in capacity ratings from 2 to 27 hp. per 100 r.p.m.

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BELOW

THIS Farrel-Sykes continuous tooth herringbone gear, over 18 ft. in outside diameter and 25 in. face, was recently made by Farrel-Birmingham Co., Inc., Buffalo, for driving a rolling mill. The gear will transmit 800 hp. at 19.85 r.p.m., corresponding to a peripheral velocity of 1130 ft. per min. The total weight of the two steel castings was 44,900 lb.

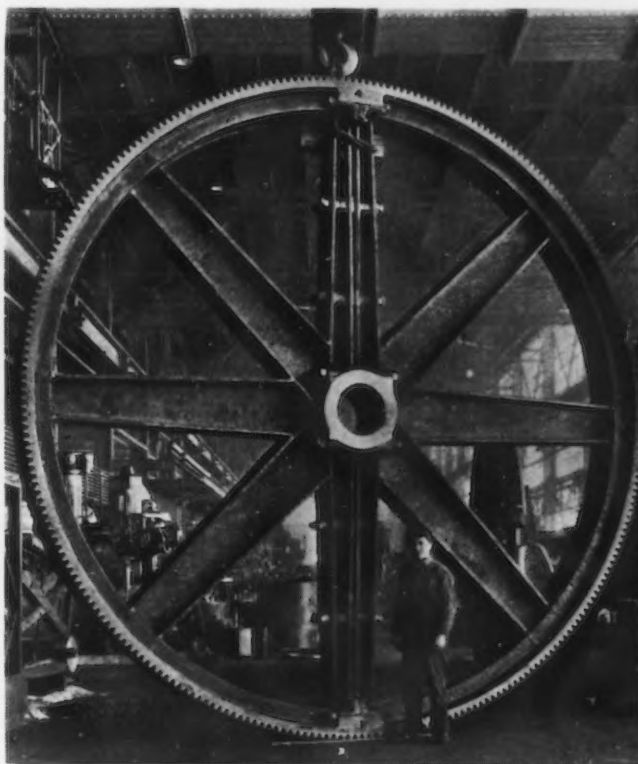


ABOVE

A LIGHT, high speed idler pulley, originally designed for use on textile spinning frames, has been developed for general industrial use by SKF Industries, Inc., Philadelphia. Parts identified on the photograph are: (1) balanced pulley; (2) dust-proof protective cover; (3) roller bearing for carrying radial load; (4) stabilizing outboard ball bearing; (5) hardened chrome steel shaft, which also forms races for bearings; (6) grease cup, which in conjunction with grease reservoir (7) holds two years' supply; and (8) mounting plate, in which a 13/16 or 1-in. hole is drilled. Five standard sizes of crowned pulleys are furnished, ranging from 2 3/4 x 31/32 in. to 4 3/4 x 1 3/4 in.



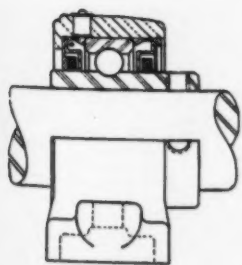
THE five intermediate sizes of the Bondtruflexible couplings have been redesigned to employ non-metallic inserts or spiders with six radiating arms, providing three driving points of contact, instead of the former four-arm insert which provided only two driving points of contact. This change has resulted in appreciable increases in the horse-power ratings of these sizes. Another innovation in the Bondtru line is the offering of the 1/4-hp. size in 38 different lengths, ranging from the standard 19/16 in. to 5 11/16 in., made up of combinations of various length flanges. The longer couplings also have one or two bakelite extension members added. These couplings are made by the Charles Bond Co., 617 Arch Street, Philadelphia.



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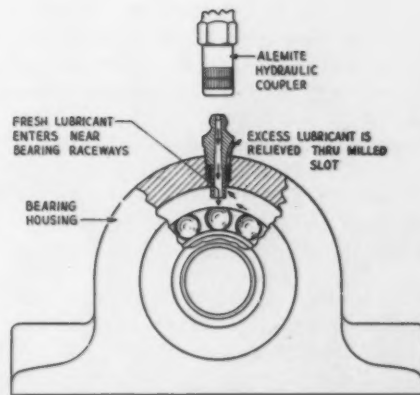
IN a new type of Alemite fitting, designed to prevent overlubrication of anti-friction bearings, the lubricant from the gun enters in the usual manner, but after a small amount of it has entered the bearing, the back pressure from the trapped air forces the excess lubricant out of a slot provided on the side of the fitting. These fittings are made by Stewart-Warner Corp., Chicago, of steel either cadmium or brass plated, the latter finish being used to identify anti-friction bearings so that they may be treated accordingly.



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CROSS-section of the new Ahlberg series ED light duty pillow block, which has a die cast housing and neoprene seals.



both forward and reverse directions, a small drum type reversing switch is used in place of the regular push button station.

The d.c. driving motor is a Reliance type T, designed particularly for adjustable speed service. It can be supplied in a variety of types, including enclosed fan cooled, splash proof and explosion proof. The motor of the speed control is a simple squirrel cage type, fan cooled and operating at 3600 r.p.m. The vertical mounting gives a very compact arrangement, the control set for a 7½-hp. motor occupying a floor space only 18 in. square.

Variable-Pitch Sheave Drive

MOLDED bakelite sheaves are now used on the improved Speedmaster variable speed drive made by *Continental Machine Specialties* of Minneapolis. The pulleys are accurately trued and balanced before assembly. An improved pressure lubricated bronze sleeve allows the splined, double cone center sheave to operate freely in positioning itself laterally between the two fixed outside members according to the varying center distances between driver and driven sheaves. Any standard V-belts can be used and they assume their proper pitch diameters when the position of the pulley set is changed.

The new construction is available in two sizes: a 3½-in. diameter size for drives up to ½-hp. capacity and a 6½-in. size for drives up to 3 hp. Control of speed is made through a quick action lever or a handwheel and screw. With a single set of pulleys, the speed range is 6:1, with a double set on a floating walking beam, it is 40:1.

Motor Conversion Drive

THE Modern motor conversion drive is now being manufactured by the *Quality Hardware & Machine Corp.*, 5841 N. Ravenswood Avenue, Chicago. It is designed for converting line shaft drives on cone pulley machines to individual motor drive. V-belts are used for the motor drive to the countershaft, the final drive being by flat belt. Tension adjustment is provided by a crank and screw that actuate a cam working directly against the base of the motor and drive shaft mounting. This vertical

adjustment also provides for shifting of the belt on the cone pulley.

Controlled Torque Flexible Coupling

TO protect mechanical drive systems against damage caused by shock overloads, the *Falk Corp.*, Milwaukee, has developed the FT controlled torque Steelflex coupling. It consists of a grid groove, flat spring type of flexible coupling and an adjustable pressure friction clutch of new design. By mounting the disk carrying the friction facings on a sleeve bushed and concentric with the hub sleeve of the driven friction disk, this part of the drive serves the sole function of limiting the torque transmitted, while the flexible coupling takes care of any accidental misalignment that eventually occurs in any drive, and any vibration that may be set up. Torque is increased up to the full rating by turning nuts on the load regulating springs. The bushing is an oilless type. Since the running coefficient of friction is only about half that of the static coefficient, once slippage occurs due to overload, it is generally necessary to stop the motor before the coupling will pick up the load again. These FT couplings are made in basic ratings from 0.4 hp. at 3700 r.p.m. up to 230 hp. at 750 r.p.m. They are said to afford protection against peak loads ranging from 500 to 1000 per cent of the normal torque.

Magnetic Clutch-Brake

STYLE FFP magnetic clutch-brake made by the *Stearns Magnetic Mfg. Co.*, Milwaukee, combines a positive clutch, friction clutch and friction brake. It can be engaged at normal motor speed, and is claimed to be the only type of magnetic friction device that gives smooth acceleration, positive running and split second disk brake stopping. It is particularly adaptable as a safety device on positive drives. It is controlled by one push button for starting and one for running.

Flexible Couplings

IN the Moreflex radial coupling, made by the *Morse Chain Co.*, Ithaca, N. Y., specially shaped rubber bushings are assembled on equispaced steel pins of the yoke or hub member. A two-piece metal housing encases the rubber blocks and also provides for attaching the companion flange to the

unit. The entire coupling is machined to insure balance. It requires no lubrication. These couplings are made in various capacities from 2 to 37 hp. per 100 r.p.m.

New Cord for V-Belts

ANEW type of super-flex Daytex cord with improved tensile strength, lower stretch, and due to interlocked fibers, minimum tendency to become lifeless, is now being used in the neutral axis of Dayton Cog Belts, made by the *Dayton Rubber Mfg. Co.*, of Dayton, Ohio. In the process of manufacturing this cord, a bonding agent removes the non-essential oils and waxes from the outside of the individual fibers, causing them to interlock and form a stronger and more compact cord. Further processing after introducing special rubber compounds normalizes the cord until the stretch is removed from the belt. The V-belts thus made are said to run cooler and to stand up under high speed flexing.

NEOPRENE synthetic rubber is being used in the manufacture of V-belts by the *Manheim Mfg. Co.*, Manheim, Pa. Such belts are offered for use where oil, chemicals and heat are present in such amounts as to destroy ordinary rubber belting. Like the Veelos adjustable V-belts made by this company, these neoprene belts are adjustable to length and are sold in roll form. They can be formed into endless belts within a minute, the company claims.

Ball Bearing Pillow Blocks

ANEW series of inexpensive, light duty ball bearing pillow blocks has been put into production by the *Ahlberg Bearing Co.*, Chicago. These units are specially adapted to domestic air conditioning equipment, fans, packaging and labeling machines and other light machinery. Series ED pillow blocks consist of a special single row ball bearing with extended inner race, mounted in a die cast housing. The ball bearing is assembled with enough play to provide for shaft deflection and misalignment up to 1 deg. Seals are of neoprene, a synthetic rubber that is impervious to oils and grease, and are of a floating construction to minimize friction. Standard shaft sizes range from ½ to 1 3/16 in.

METAL

PHOTOGRAPHIC FILM

FINAL tests recently were performed on what is said to be one of the most significant developments in photography since Daguerre. Daguerre's original photographs and this new development are similar in that both processes are on metal. For over 18 months in the photographic division of *International News*, negatives and positives and enlargements have been produced, and it is said that certain experts believe that this new metal base will change procedure and technique and save time and money to a remarkable extent.

The use of metal film is the culmination of research going back over 20 years, and the prints tested were produced by the Taylor-Sloane Corp., 342 Madison Avenue, New York. Paper and film are completely eliminated. The finished prints on metal have detail, gradation and tonal value similar to carbon or platinum prints. Exhaustive tests for over 25 years have established the fact that prints on metal are changeless, fadeless, and permanent. When soiled, they may be washed with soap and water, according to the Taylor-Sloane Corp.

Those who have examined the positive prints have expressed surprise at the range of background available on this new metal alloy. Colors and textures range from a fine white satin finish to a highly polished reflective surface, that gives the impression of cloisonne enamel on burnished silver. The surface of the metal may be frosted or reticulated to give artistic etched or lithographic effects.

When in commercial production, the metal (an alloy, 92 per cent aluminum) will come in rolls up to 36 in. wide or in sheets up to 8 ft. x 10 ft. The available thickness will be from 0.003 in. up to 0.25 in. The standard thickness for general use is 0.004 in. At this thickness the metal weighs exactly the same as cellulose acetate or cellulose nitrate film or double weight paper. The price for the sensitized metal will be less than standard photographic film and paper.

• • •
PHOTOGRAPHIC print on metal, an alloy containing 92 per cent aluminum. Plant and equipment are now being prepared to produce this film in commercial quantities.
• • •

It is said that prints can be turned out on metal film at unusual speed. The fine grained standard print requiring 15 min. to produce, is turned out on metal in 7 min. The reason for this is that the developer does not penetrate into the metal base and is readily washed out. The hypo also is confined in its action to the photographic image and requires only 15 sec. for complete reaction. Washing is only a matter of seconds and drying may be done over any heating unit at a temperature as high as 400 deg. F. With enlargements, the printing and developing time is cut down to 1/3, and long tedious washing is completely eliminated. Drying may be done in less than 5 min.

Metal film will be a great advantage for outdoor signs, advertising cards, poster, modern synthetic varnishes or laquers, may be sprayed or rolled on the metal photographs and baked in at high temperatures. These prints may be used outside or in windows, where the life of a paper print, because of dust and grime, is usually about 7 days.

The unusually fine grain characteristic of prints on metal is not to be expected at such high speeds. One explanation that seems to be feasible is the fact that the light which passes through the sensitive emulsion reflects back from the specular surface of the metal, thus affecting the sensitive coating over the entire area of exposure.



No new equipment is necessary for making photographs on metal. Standard light, printing frames, enlargement equipment lenses, cameras, remain the same. All standard developers and fixing agents may be used. The only change necessary is in technique. The operator must get used to the rapid printing, developing and fixing and arrange for drying units that finish the print in a few moments. The large field of aerial and record photography is expected to be pleased to learn that here at last is a photographic print that will assure them of positively accurate measurements at all times.

For the reproduction of color on metal, positive color register is assured without shrink or stretch. The projection of metal film is by reflect light. Actual tests are said to have demonstrated the fact that images may be reflected from this metal film, giving a higher intensity of light at the screen, than that given by passing light through ordinary film.

The research work on this metal film was directed toward producing a metal base that would not rust, corrode or oxidize under any condition. It also necessitated a metal that could be passed through a projection machine, withstanding the heat and tension of the sprockets. The emulsions developed on the metal are equal in speed, contrast and other factors to any modern photographic emulsion.

THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

... Automobile assemblies stage a contra-seasonal comeback, climbing to 78,305 cars and trucks ... Sales also in good volume for this time of year ... Detroit plant gets airplane contract.

DETROIT—With Chrysler assemblies following a five-day schedule to make up for its virtually complete suspension of production forced by the Briggs strike, automobile production staged a sharp contra-seasonal advance in the past week. This favorable rise in one of the country's most important industries was accompanied by signs of increased vigor in retail sales, also a somewhat contra-seasonal indication.

Output for the past week is estimated by Ward's Automotive Reports at 78,305 cars and trucks for the United States and Canada, the highest level of assemblies since the week in May preceding the Briggs strike. The

week's production was more than 13,000 units better than that of the previous week, when 65,265 units rolled off the assembly lines. A year ago assemblies were running at the level of 44,790.

The gain was recorded despite a seasonal reduction in some plants and active preparations for 1940 models in at least one other group of plants. Ford tapered off from 17,500 cars and trucks to 15,000 but increased the volume at the Lincoln-Zephyr plant from 160 to 500. Chevrolet gained 1000, to 19,000.

Biggest gain of the week was recorded at Plymouth, which is now out to make up for lost time. It is esti-

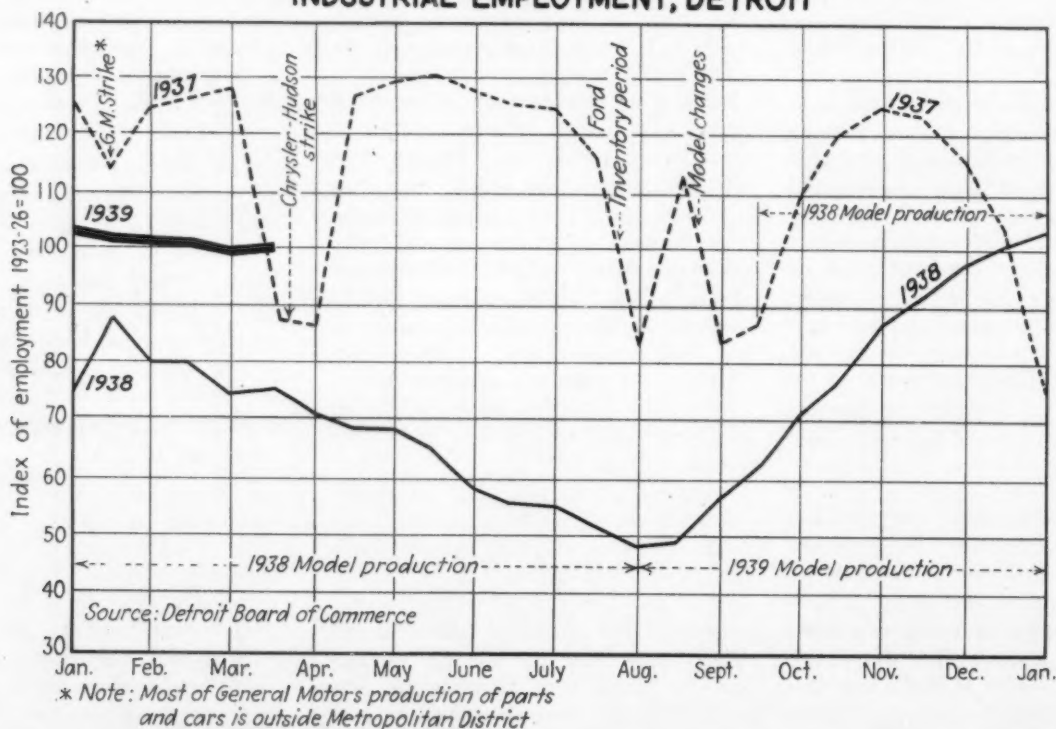
imated that this plant turned out 11,900 cars during the week. This is Plymouth's high point for 1939 so far. The best previous week on record ended April 21 with 11,700 cars rolling through the Plymouth gate. The average has been under 10,000. Before the strike at Briggs halted Chrysler activities, Plymouth was operating at the 8500 level.

This healthy activity in Chrysler plants nearly tripled output by stepping upward from 8145 to 22,900. A year ago, in the corresponding week, Chrysler plants only turned out 7195 cars.

Buick Sales Volume Steady

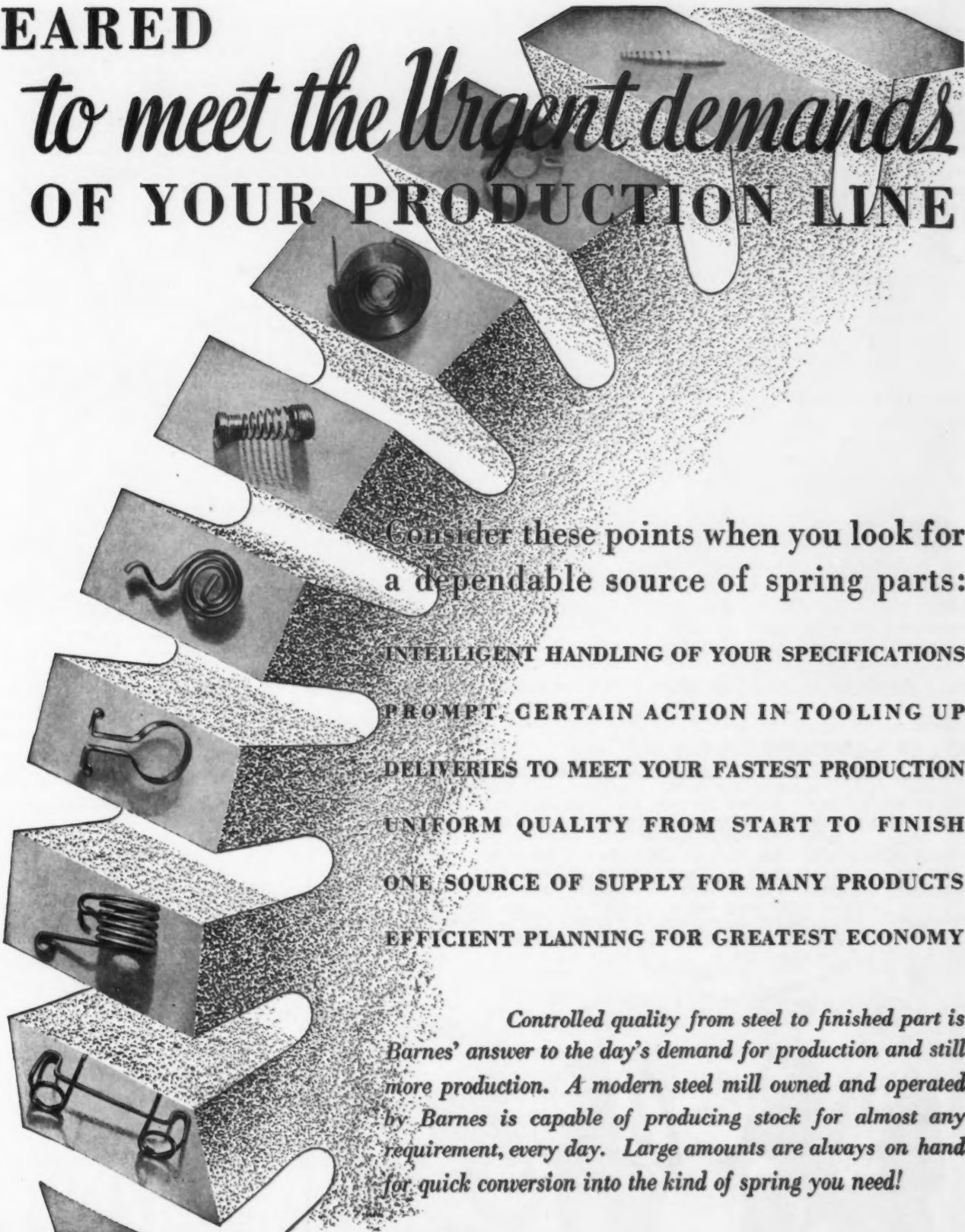
June is proving to be an unusually good sales month. Buick is operating five days a week and W. F. Hufstader, general sales manager—feeling the pulse for the first 10 days of June—has reported that Buick sales are maintaining the steady volume experienced

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during the past 90 days. The early sales of the month were 42 per cent higher than last year and a shade better than those of the first 10 days in May. Oldsmobile registers an unusual balloon-like ascent with retail transactions in the first 10 days of the month 94 per cent greater than in the same period last year, and also has a 7 per cent gain over its early May sales.

These late spring gains are unusual but are general throughout the industry this year. For instance, for the first time since 1933, Chevrolet dealers' May deliveries of new passenger cars and trucks this year eclipsed those of April. The month's retail deliveries totaled 77,125 units, 34.8 per cent above the total for May a year ago. Ordinarily, however, April is the month of greatest sales, with volume continuing strong until mid-May, in most cases, and then tapering more or less sharply.

Buick's outstanding success and spectacular expansion in retail volume has been the subject of recent comment. This General Motors division has multiplied its retail volume and manufacturing totals about five times in the last five years. Extensive modernization and plant expansion costing about \$50,000,000 has been part of the

Buick program. Harlow H. Curtice, division president and general manager, has headed Buick since October, 1933, and his part in Buick's gains is being widely heralded. Lower prices and a more complete line of cars have combined to increase sales from approximately 40,000 cars in 1932 and 1933 to more than 230,000 cars in 1937.

Expect Another Big Year

Company officials anticipate another "big year" in 1940. An unusually complete line of cars will be introduced early in the selling season so the sales force will again have the much-prized "lead off first base" on 1940 models.

The highly successful Buick "40" and Buick "60" are expected to be continued in the line with refinements and minor changes in appearance and front end sheet metal that will characterize the majority of 1940 model cars.

But a new series, radically different in appearance and with an unusual chassis design, will be fitted into the Buick picture as the Series "50" and the "Series 70." Above the 40, 50, 60, 70 models, the line is not expected to change a great deal. The two new cars have been highly streamlined (competition says somewhat in the Lincoln-

Zephyr style) and one of the widest standard automobile bodies will make its appearance on these cars. The frame is spread out ("fanned") to give support to the wider body and add to stability. As reported previously, assembly lines should operate in July, probably about the 15th.

Stinson Gets Airplane Contract

Detroit is again going to see some mass assembly of aircraft on a scale not witnessed since World War days. Extension of the plant of Stinson Aircraft Division, Aviation Mfg. Corp., along with increased payrolls and addition of new equipment were indicated in reports received in Detroit last week that the Stinson plant had received a War Department contract for \$1,500,000. This order is the largest ever placed in Michigan for military aircraft. Approximately 100 airplanes are called for by the contract.

They will be a small type observation plane, of a design which fits in well with Stinson's present setup for the manufacture of welded steel tube fuselages and monoplane wings. The planes are said to be a high-wing monoplane type, seating a pilot and an observer in an enclosed cabin. They are particularly adapted to short-range contact work with infantry and will have slots and flaps to assist landing and take-off in small areas.

It is also reported that the engines will be of Continental radial type built in Detroit.

While no official word could be obtained about the design, it is known that none of the new planes has been constructed or flown yet, but complete design and wind-tunnel work has been done. The Stinson military order marks its entrance into this field. The company also has a backlog of \$400,000 in orders for its new three-place cabin cruiser selling under \$3,000, on which production was begun only a few days ago.

New Plant at Owosso

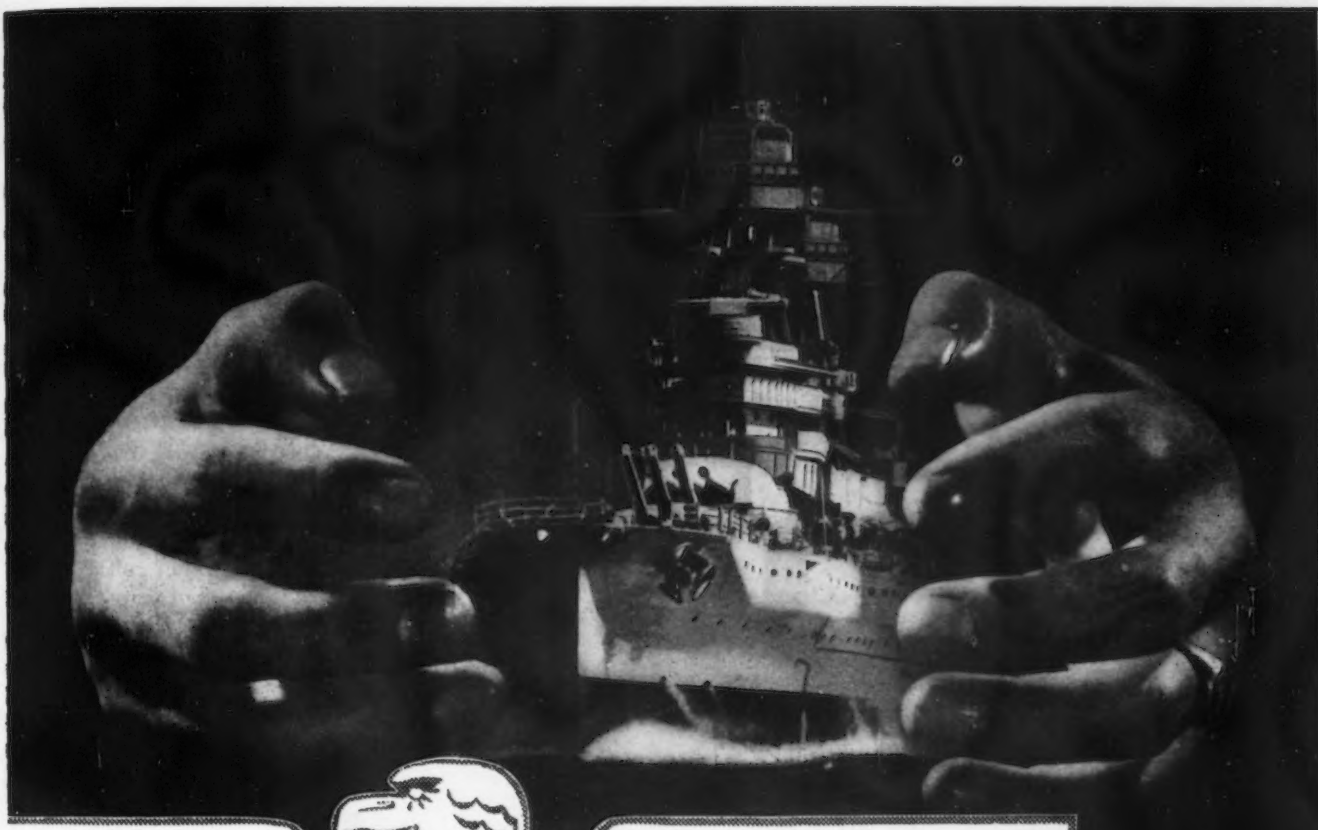
The Fedder Mfg. Co. of Buffalo has started construction at Owosso, Mich., on the first unit of a new plant to manufacture tubular radiator cores for Chrysler. The plant, which will eventually employ 1000 men, will get into production by July 15 (such speed in construction of plants in the automotive area amazes even veteran structural men when they come to Detroit and is newsworthy for that reason). The first unit is 600 ft. long and 240 ft. wide and will cost \$600,000, completely equipped. Other units will

(CONCLUDED ON PAGE 64)

THE BULL OF THE WOODS

BY J. R. WILLIAMS





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MERIDEN, CONNECTICUT

THIS WEEK IN WASHINGTON

... New Deal cooking up new spending schemes to aid both durable goods and consumer goods industries ... Railroad equipment purchases on large scale involved in one plan ... Industrialists tell Senate committee that Wagner Act and Labor Board have interrupted years of satisfactory labor relations.

By L. W. MOFFETT

Washington Editor, The Iron Age

WASHINGTON—Eager to perpetuate itself in office, the New Deal is feverishly trying to cook up schemes to give the election year 1940 a veneer of business recovery. With the Federal debt piled up to the staggering sum of \$40,000,000,000, unemployment rolls standing at the enormous figure of 11,000,000, expenditures of almost two dollars for every dollar taken in, and business in the doldrums, the New Deal is frightened over its political prospects. With the possible exception of the outright left-wingers, Administration insiders realize the heavy political handicap these conditions erect.

So far as possible they want to reduce these barriers, at least during the campaign. Its very existence built and maintained on artificiality, the New Deal again is proposing the anodyne of spending other people's money. Pump priming is admitted even by prominent New Dealers to have been a colossal failure, and some even concede Santa Claus as an Almoner has lost caste to a disconcerting degree. Yet out of desperation still another fling of the dice is being planned as a gamble that this spending bender will delude the voters into imagining they see recovery under way. Large shots in the arm are to be given to business, particularly to durable goods industries, often the whipping boy of the New Deal.

It is a growing conviction that the President is keenly desirous of succeeding himself. Probably more so than any of his predecessors, Mr. Roosevelt greatly enjoys the office, and the power it has given him, much

of it enhanced by his own dictation to a truckling Congress. Also to one of Mr. Roosevelt's temperament, with a flair for the dramatic, he would cherish the historic precedent of being the first man ever to be elected President for the third term. There are those who wonder if he might not seek further terms.

One Plan Involves Purchases of Railroad Equipment

Like all New Deal programs, the assumption can be drawn that the one presently in the mind of the Administration is subject to change without notice. As announced by the President at his press conference last Friday, it has two phases. Inevitably they are built upon large spending. To give it the color of not increasing the public debt, the plan proposed calls for Government money for so-called self-liquidating projects. The plans and types of projects have been discussed by the President with his special committee, composed of Secretary of the Treasury Morgenthau, Chairman Eccles of the Federal Reserve Board, Budget Director Harold D. Smith and Chairman Frederic A. Delano of the National Resources Committee. Included in the program is a renewed plan for heavy purchases of railroad equipment through two means. By one, purchases would be made direct by the railroads through long-term RFC loans. By the other, the Government would buy and have built railroad equipment through a corporation set up under the RFC, the equipment to be leased to the carriers. The Government would hold title to equipment until and unless it

was ultimately bought by the carriers.

The proposed outlay for the program, it is said, has not been decided upon. Figures discussed are reported to range from \$1,000,000,000 to \$3,000,000,000. Neither has the type of the projects, outside of railroad equipment, been determined but it is said they would be spread with a view to stimulating the durable goods industries generally in the hope to provide widespread employment and at the same time reduce relief rolls.

The President said legislation might be offered to remove present limits on the amount of funds which could be loaned by the various Government agencies. He explained that it was not believed necessary to set up separate corporations to finance the program.

Would Railroads Cooperate?

There is considerable speculation as to whether there would be much interest in entering upon the projects, even at low rates of interest which it is expected the Government will offer as an inducement to encourage the movement. It is well doubted that in view of their financial plight the railroads will show much interest in the proposal for either RFC loans to buy equipment or to have the Government build the equipment and lease it under present unfavorable traffic conditions. It is well known that the carriers are not pushing legislation now under consideration for RFC loans to the rail carriers. There is also the feeling that already the Government has too heavy a financial hold on the railroads. If it is much further increased, as could particularly be the case under a system of "leasing" equipment, it is maintained broad Government control might develop for affected lines. In the past the "leasing system" has been suggested but received little or no response from the railroads.

Administration's Theories Shift

The shifting theories of the New Deal to stimulate recovery have also caused considerable comment. The outstanding point made is that the policy being sought is the one which is held to have the most political value. Underlying all plans, of course, is Government spending. But there have been shifts back and forth. Con-

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sumer expenditures through WPA are fixed upon for a while. Then the play is made to the durable goods industries, through PWA. In his recent address before the American Retail Federation, the President played on the chord of consumer expenditures, saying that the large portion of the Government's dollar goes over the counter of the retailer. He spoke sarcastically of those who "say we should glue all of our attention on the heavy industries and should do everything to get

these industries to work and to get investors to put up the money to build new buildings and new machines without regard to the average consumer's need or his ability to use these buildings or machines." At a press conference soon after the President replied in the negative when asked if the Administration had a new PWA program in contemplation. He also said no when asked if the Administration had a new spending program in contemplation. The \$1,735,600,000 WPA

relief bill passed by the House last week carries \$125,000,000 for the PWA.

Representative Dirksen, Republican of Illinois, reflected a common view when he said that the Administration now proposes a spending program which is a combination of both durable and consumer goods purchases.

"If you have followed the Temporary National Economic Committee, if you have followed the messages from the White House, if you have followed the pattern in the legislation that has been suggested here, you will find that there has been a shift in philosophy and theory, and now there is going to be joint emphasis upon the durable goods and upon consumer expenditures, in the hope that that is going to ring the bell, and stimulate that elusive thing called prosperity," he said.

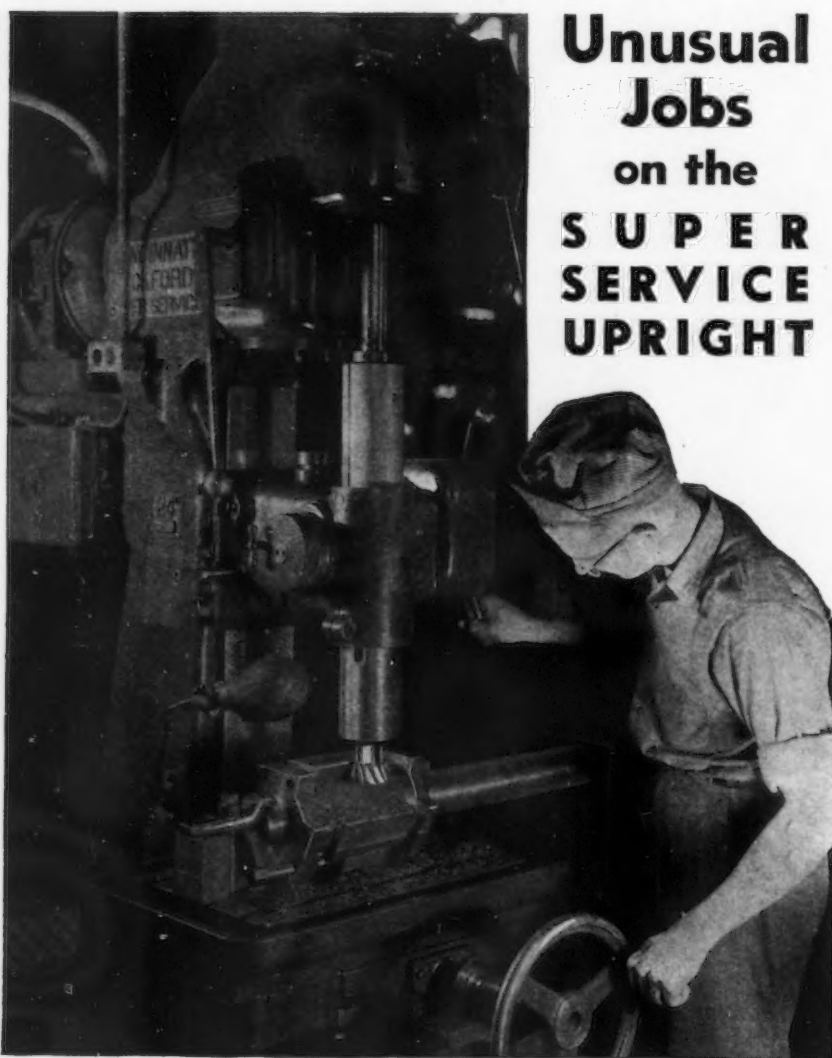
Perry, Bell Appointed By War Department

WASHINGTON — J. L. Perry, president of Carnegie-Illinois Steel Corp., and F. D. Bell, president of Edgewater Steel Co., Pittsburgh, have been named by Assistant Secretary of War Louis Johnson, together with seven other industry representatives, to assist in the distribution of orders under the Administration's \$34,500,000 educational orders program, designed to familiarize industry with the Government's war-time requirements. Others named include the following:

E. M. Allen, president of the Mathieson Alkali Works; Carl L. Bausch, vice-president of Bausch & Lomb Optical Co.; William H. Coleman, president, Bucyrus-Erie Co.; Donald W. Douglas, president, Douglas Aircraft Co.; John Hancock, of Lehman Brothers, a World War Naval Supply Corps officer; William Knudsen, president, General Motors Corp., and Charles J. Stilwell, president, Warner & Swasey Co.

The War Department awarded its first educational orders in April under a congressional appropriation made last session. The full \$2,000,000 appropriated for the current fiscal year went for orders placed with six companies.

The approved \$34,500,000 authorization would cover expenditures for the next three years but Congress has yet to authorize an appropriation for the new fiscal year which begins July 1. Approximately 270 plants are expected to receive trial orders under the new program.



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Write for Bulletin U-22.

THE CINCINNATI BICKFORD TOOL CO.
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Industrialists Charge That Wagner Act and Labor Board Have Interrupted Years of Satisfactory Employee Relations

WASHINGTON—How the National Labor Relations Board and the Wagner Act interrupted years of satisfactory relations between employer and employees, destroying confidence and isolating management and labor, was described to the Senate Education and Labor Committee last week as the committee received further testimony from metal trades spokesmen at the request of Senator Burke, Democrat, of Nebraska, bitter critic of the NLRB and sponsor of a bill to revise the Wagner Act.

The case involving the Fansteel Metallurgical Corp. of Chicago, in which the Supreme Court outlawed the sit-down strike, cost the concern more than \$135,000, including \$60,000 direct damage occasioned by the sit-down strike, according to its counsel, Max Swiren, who expressed the view that the heavy expense burden necessary to fight a labor board case explains many of the so-called "settlements" that the board is able to effect with the small and moderate sized companies.

Mr. Swiren, who described Fansteel's experience with the Labor Board from the first threat by the field examiner to the final decision by the Supreme Court, told the committee that the union organized at Fansteel was merely "an offshoot" of some of the larger labor organizations in the Chicago area and that the purpose of the sit-down strike at his plant was "to develop a show of force that would coerce all of the other plants into going along" with the CIO.

Relations Harmonious for 30 Years

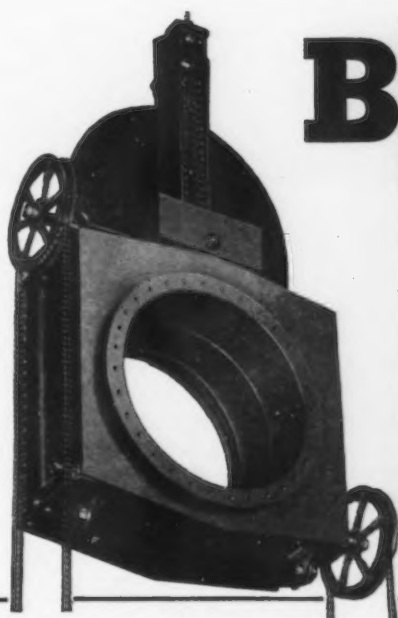
For more than 30 years the company had enjoyed harmonious relations with its employees, unmarred by strife or controversy and the labor turnover was negligible, Mr. Swiren said. He recalled that an NLRB field examiner injected himself into the picture on the grounds that the union had filed charges with the Labor Board after the company had rejected a contract calling for a closed shop and check-off system.

He related that no vote authorizing either a strike or a sit-down strike had even been taken by the union but that a decision to seize the plant was made

by "a small committee," which, he said, was undoubtedly acting under the guidance of the field representatives of the SWOC. During the sit-down strike, an NLRB examiner, who also

carried credentials from the La Follette Civil Liberties Committee, made frequent trips into the buildings to confer with the sit-downers, he testified. These sit-down strikers, Mr. Swiren continued, were defying a court injunction and resisted with violence the sheriff; and the NLRB examiner proceeded to act as an intermediary between the sheriff and the sit-downers.

Reminding the committee that the condonation of the sit-down strike by



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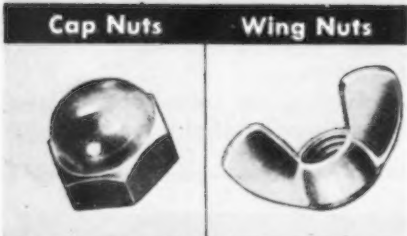
- 1** The valve should operate in a straight line rather than as a goggle.
- 2** The valve structure should have sufficient beam strength to require no support from the ground.
- 3** The valve must be self-contained in that it must embody an expansion joint, the retracting mechanism being completely independent of the structure of the valve body. Movement of the clamping flange must be positive in both directions.
- 4** The valve opening must be equal to the diameter of the pipe, and must be free from obstruction to the flow of gas.
- 5** The valve plate must be sufficiently stiff to avoid accidental distortion, and to maintain a tight joint. It must be capable of positive mechanical movement in both directions. It should be capable of full counterweighting when operating vertically.
- 6** The valve must be capable of location and operation in any position, vertical, horizontal or inclined. For this reason the valve plate should be positively moved away from engagement with its seat at the beginning of motion, and should be returned to contact at the end of motion.
- 7** The construction must be adapted to the use of either hot or cold gas.
- 8** The operating mechanism of the valve should be on the outside, and capable of examination. The mechanism should be capable of lubrication, and should be dirt-proof.
- 9** The contacting surfaces should be of non-corrosive material.
- 10** The valve should be capable of rapid manual operation without undue exertion by the operator.

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the Labor Board in the Fansteel case had created such indignation that early this year individual members of the board were compelled to comment on the incident. Mr. Swiren charged that when board members appeared before a congressional committee two weeks before the Supreme Court decision in the Fansteel case, by "a deliberate misstatement of facts," they sought "to mislead both the public and the Congress as to issues involved."

Reviewing the early Labor Board hearings on the case, the witness asserted that not a single subpoena requested by the company was granted, yet not a single subpoena requested by the board's attorney was refused. The NLRB attorney, he declared, was provided with an unlimited supply "signed in blank."

Says NLRB Fosters Hostility

Harry S. Falk, of the Falk Corp., Milwaukee, pointed to the history of his plant, which he said bears out the close relations which always existed between employer and employee prior to the Wagner Act. Since an NLRB hearing in August, 1937, however, "there has been a change in this relationship," he told the committee, explaining that the firm's dealings with the Labor Board "have fostered a spirit of hostility and suspicion in which we are asked to hold our employee at arm's length, instead of inviting him to sit down and talk over his problems in a friendly way."

Bitterly criticizing the NLRB for handing down "arbitrary conclusions," the witness declared that "the conclusion in our case, as well as in thousands of others where the same conditions exist, is inescapable that if sound business enterprise is to be encouraged there is serious and urgent need for change in this law to eliminate suspicion, fear and hostility and to replace them once more with mutual confidence and trust."

NLRB "Made Life Miserable"

D. C. Fink, of the Auburn (Ind.) Foundry, Inc., also indorsed changes in the Wagner Act proposed by Senator Burke, and testified that his concern had developed to the point where expansion was just around the corner when the CIO and the NLRB "came along and made life miserable." He chided committee members for congressional proposals to increase credit machinery for small business, pointing out that "vicious labor legislation was troubling him" and not lack of Government credit facilities.

Charging the Labor Board had decided unfairly against his company in a labor relations complaint, Mr. Fink told the committee:

"No business in the nature of ours can run successfully if a portion of every day must be spent trying to outsmart and outwit and outmaneuver a bunch of racketeers and parasites who are endowed with eloquent and persuasive power."

Says Lawyers Are Inexperienced

Leon B. Lamfrom, counsel for Mr. Falk, characterized Labor Board lawyers as for the most part "too young and inexperienced to keep the agency out of hot water. Describing them as "not soundly grounded in the ethics of their profession," he said he also agreed with Senator Ellender that "a lot of ignorance is shown by NLRB lawyers."

Mr. Lamfrom took the stand after Senator Ellender, Democrat of Louisiana, questioned Mr. Falk as to his connection with the National Metal Trades Association, the organization which was the subject of an inquiry conducted by the Senate Civil Liberties Committee. The witness said he was a member of the organization administrative council but was not entirely familiar with the La Follette committee's report on association activities, which charged that detective agencies had been employed to conduct labor espionage work. Mr. Falk said he could not disclaim any of the conclusions reached by the committee in its report because he did not know what those conclusions were.

(ADDITIONAL LABOR TESTIMONY
ON PAGE 78F)

More Contracts Awarded By Navy Department

WASHINGTON—The Navy Department's Bureau of Supplies and Accounts announced recently that contracts had been awarded to these companies: Moore Machinery Co., San Francisco, press brake, \$9,672; The Watson-Stillman Co., Roselle, N. J., forming press, \$58,500; Electric Industrial Equipment Corp., Baltimore, conduit pipe, \$10,810; Worthington Pump & Machinery Corp., Harrison, N. J., air ejectors, spare parts, tools and wrenches, \$8,450; Wm. Sellers & Co., Inc., Philadelphia, turret track machines, \$130,000; The Atlas Car & Mfg. Co., and the Atlas Bolt & Screw Co., Cleveland, locomotives, \$56,057; H. K. Porter, Inc., Pittsburgh, locomotive, \$12,350; and Tidewater Supply Co., Inc., Norfolk, Va., internal grinder, \$8,339.

Purchase of the inventory, jigs, tools, dies, goodwill, trademarks and patents of the Prima Mfg. Corp., Sidney, Ohio, was announced by the Automatic Washer Co., Newton, Iowa.

Australia's Iron and Steel Exports Showing Expansion

WASHINGTON—An appreciable expansion in Australia's iron and steel export trade, with exports of manufactured and semi-manufactured iron and steel products in the nine months ended March 31, 1939, valued at \$5,073,000 compared with \$3,622,000 in the corresponding period of 1937-1938, has been reported to the Commerce Department.

The report pointed out that in the past New Zealand was the destination for virtually all Australian iron and steel exports but that in recent months orders have been received from Great Britain and certain Eastern countries. During March, the department said, shipments of steel were made from Australia to Singapore and shipments of pig iron to Hong Kong.

The report recalled that early in May, orders for more than 50,000 tons of steel plates and 10,000 tons of galvanized iron sheets for building air-raid shelters in England had been placed in Australia by the British Government. A recent statement of the Commonwealth's largest steel producer, the report said, shows that its steel output increased substantially during the past year.

Procurement Division To Do More Purchasing

WASHINGTON—President Roosevelt has signed an order directing all Government departments except War, Navy and the Marine Corps hereafter to route all their purchases through the Treasury's Procurement Division, which was created in 1933 in an initial move to consolidate all Government buying.

Since its creation, the Procurement Division has purchased supplies for all departments in Washington except War, Navy, Marine Corps, Post Office, Agriculture, Interior; and in the field when ordering a few special items. The President reportedly limited its authority in this manner to prevent too drastic a change in the buying habits of the various divisions of the Government.

The departments affected by the latest order can continue to make their own purchases direct but the director of the Procurement Division can make the shift effective whenever he finds that his organization is equipped to handle the expanded activities.



HANDLED WITH A YALE ELECTRIC TRUCK

7,500,000 lbs.—3,750 tons... A lot of tonnage in any man's language. Yet that's what one operator using a Yale High Lift Electric Truck is able to handle in 3 months for the Atlanta Plant of the King Plow Company.

And the units to be handled are not standard in size or shape. They run the gamut from metal scrapes to the heaviest die cuts. A real handling job if there ever was one.

Here's what the King Plow Company has to say about their Yale Electric Truck:

"This truck does a 4-5 day job in 11 hours... We find many jobs for this equipment which it was not originally installed to do... Almost before it was put to work it paid for itself... This truck never hesitates even for the longest and steepest ramps... It is indispensable—has saved substantially."

Indispensable—Never hesitates—Saved substantially... these words means saving and efficiency to the King Plow Company. And they can mean the same to you—for the Yale Electric Truck always conforms to the same service standard—the best.

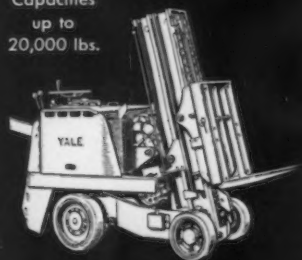
It has to. Its drive units are more powerful... its construction is stronger—its engineering is more advanced. More than just a truck—the Yale Electric Truck is a mechanical efficiency expert! Send for free catalogue giving full information.

Trained sales engineers are located in 56 major industrial centers ready for instant service. Consult your classified directory.

HIGH LIFT TRUCKS
Capacities up to 30,000 lbs.



TILTING FORK TRUCKS
Capacities up to 20,000 lbs.



LOW LIFT TRUCKS
Capacities up to 20,000 lbs.



YALE MARKED IS YALE MADE



THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
IN CANADA: ST. CATHARINES, ONT.

Government to Spend \$25,000,000 For Strategic Materials in Year

WASHINGTON — War and Navy Department officials disclosed last week after a White House conference that they plan to spend \$25,000,000 during the fiscal year beginning July 1 for the purchase of strategic and critical materials as a first step in building up a war reserve.

This figure is \$15,000,000 above the amount recommended several months ago by President Roosevelt and budget estimates have indicated right along that only \$10,000,000 would be spent in the next fiscal year. The President signed the bill two weeks ago. It authorized \$100,000,000 to be appro-

priated for the four-year period ending in June, 1943, for the procurement, transportation, maintenance, rotation and storage of the stock-pile commodities.

Officials would not designate which supplies would be purchased first, protesting that they were anxious to prevent any price increases. It was believed likely, however, that the first buying would include "strategic materials" upon which this country depends almost entirely on foreign sources. A list of strategic materials approved by the Army and Navy Munitions Board includes antimony, chromium, manganese, nickel, tin, tungsten, quartz crystals, rubber, mica, quicksilver, and quinine.

Critical materials, described as those commodities essential to the national defense less difficult to obtain than strategic materials but nevertheless requiring some degree of conservation and distribution control, include 20 materials, comprising cadmium, cryolite, fluorspar, graphite, platinum, titanium, toluol and vanadium and others.

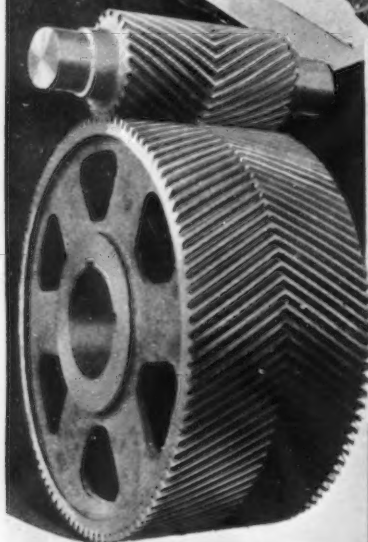
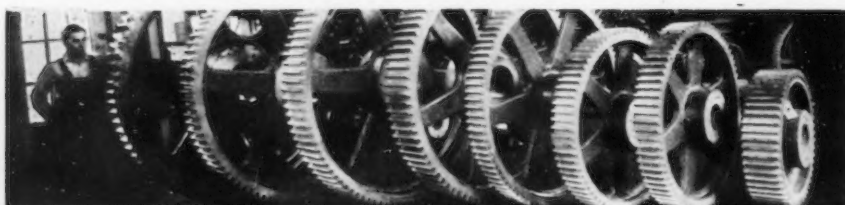
Essential materials neither strategic nor critical are those described as being essential to the national defense, for which no procurement problems in war are anticipated; but whose status is such as to require constant surveillance because future developments may necessitate reclassification as strategic or critical. They include 35 commodities, among which are iron and steel, copper, abrasives, lead, magnesium, molybdenum, sulfuric acid, uranium, zinc, zirconium and acetic acid.

Vacations with Pay Have Grown Rapidly in Industry

WASHINGTON—The annual vacation with pay will soon become commonplace in American industry if the movement continues to grow at the present rate, the Bureau of Labor Statistics announced last week, reporting that out of 970,800 employees in the industry group identified as "iron and steel and their products, not including machinery," 691,210 workers in 1937 enjoyed vacations with pay, or about 71.2 per cent.

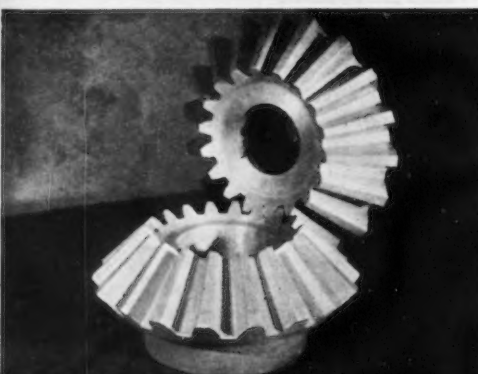
Under the industry classification of "machinery, not including transportation equipment," the bureau reported that 731,072 employees out of a total of 1,142,300, or 64 per cent, represented wage earners who were included under the vacation plans.

The iron and steel industry now



TO Your SPECIFICATIONS

WITHIN one plant . . . under one management . . . with one responsibility, are produced steel castings . . . rough, finished, heat treated as specified . . . Diversified, industrial Neloy gears for highly specialized applications . . . Complete assemblies of gears and housings . . . That is the day's routine here at National-Erie Corporation . . . Complete facilities are available for your specific requirements . . . To prove it, simply ask for bulletin No. 5 on your regular letterhead . . . no obligation whatever . . . Your orders will be handled promptly and efficiently.



ABOVE, a Neloy 10-B Sykes Herringbone main drive gear and pinion with flame hardened teeth. Gear cast in Neloy electric steel, machined and flame hardened under National-Erie control. At the right, special Neloy 10-B roll table mitre gears. Full description of Neloy on page 15, bulletin No. 5. Write for it!

NATIONAL-ERIE CORPORATION
ERIE, PA. U. S. A.

ranks third of the industries adopting the paid-vacation, having forced rubber into fourth place when steel plants adopted paid-vacation plans en masse in 1936-1937, the bureau said. The "iron and steel industry" as used in the bureau's classification also included manufacturers of cast iron pipe, cutlery, hardware, plumbers' supplies, stoves, tools and wire work.

Pennsylvania Asks Steel Rate Extension

WASHINGTON—The Pennsylvania Railroad has applied to the Interstate Commerce Commission for authority to extend on one day's notice from June 30 to Dec. 31, local and proportional iron and steel rates to the following points: Bessemer, Clarendon, McKeesport, and Kiskiminetas Junction, Pa., and Olean, N. Y.

Application has been made by Central Freight Association carriers to file on one day's notice a rate of \$2.37 per gross ton on scrap borings and turnings from Detroit to Port Colborne, Ont. The present rail rate is \$4.80. The reduced rail rate is sought in order to meet water competition. The application says there is an accumulation of some 4000 tons of scrap at Detroit and that it is proposed to start the movement to Port Colborne immediately with the expectation that shipment will be completed within six weeks.

Educational War Orders Totaling \$14,250,000 May Be Placed in Next Year

WASHINGTON—The War Department will spend \$14,250,000 during the fiscal year beginning July 1 for placing additional educational orders with firms to familiarize them with the manufacture of non-commercial items of technical design necessary for wartime requirements if Congress approves the supplemental military appropriation bill which was reported favorably last week by the House Appropriations Committee.

Congress approved the broadened educational program last April when it authorized an expenditure of \$42,500,000 to be available during the fiscal years 1939, 1940 and 1941 and \$2,000,000 during each of the next succeeding four fiscal years. The War Department had \$2,000,000 on hand during the current fiscal year for

placing orders but exhausted this amount by awarding contracts to six companies.

The six firms, which were the first and the only ones thus far to receive awards under the program, the items ordered, and the amounts involved follow:

The Goodyear Tire & Rubber Co., Akron, gas masks, \$192,000; Winchester Repeating Arms Co., New Haven, Conn., new semi-automatic rifles, \$1,384,500; General Electric

Co., Schenectady, searchlight for anti-aircraft artillery, \$205,400; R. Hoe & Co., New York, recoil mechanism for anti-aircraft gun, \$110,981; S. A. Woods Machine Co., Boston, machining 75 mm. shell, \$83,770, and American Forge Co., Chicago, forging 75 mm. shell, \$20,250.

The department said last April that by July 1 it expected to have invitations for bids in the hands of "a substantial cross section of American industry."



WAMPUM MEANT MONEY TO THE INDIAN



MEANS MONEY TO YOU!

Wampum was the Indian's word for money. It was his medium of exchange. So many black and white shells—so much wampum.

There are many symbols for money.

The word *Wyandotte* means money to the man whose job it is to clean metal prior to finishing. Wyandotte is not only a cleaning compound; it is also a service. Wyandotte metal cleaners save time and money . . . Wyandotte service gives special attention to special jobs of metal cleaning.

Wyandotte has meant money saved in many finishing plants the country over. Why not put Wyandotte to work for you? Call your Wyandotte Service Representative today. He will be glad to place his time and experience at your disposal—without obligation.

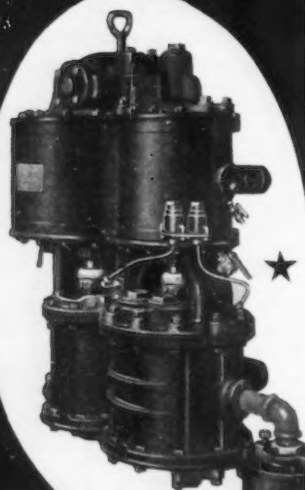


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AIR . . . COMPRESSORS

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COMPANY

Builders of high grade
pneumatic apparatus for
almost 70 years.

★ STEAM-DRIVEN TWO-STAGE

Sturdy locomotive type.
Gives dependable long-
time service for factory
use. Steam and Air com-
pounded for economy.
Easily installed on post,
wall, or stand. 150 cu. ft.
Steam 100 lbs. Air 80 lbs.
Smaller sizes, single stage.

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Literature on Request

Westinghouse
AIR BRAKE CO.
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PITTSBURGH, PA.

Blueprint Reading Course For Welders

A NEW book entitled "Simple Blueprint Reading with Particular Reference to Welding and Welding Symbols" is being announced by the Lincoln Electric Co., 12818 Coit Road, Cleveland. Although compiled primarily for welders the book contains information of value to anyone concerned with mechanical construction. It affords a basis for study which, together with practice in the actual reading of drawings, will guide the student to proficiency in this important subject. It is designed to permit learning in a comparatively short time what it usually takes several months to pick up in the ordinary course by everyday shop work.

The various symbols used in drawings of different types of welded joints, including butt, corner, fillet, lap, etc., are comprehensively explained. The 85 illustrations in the book include examples of drawings of a number of machine parts, pipe connections, general construction details, tanks, etc. Questions and answers at the end of the book permit the student to test his knowledge. The book contains 140 mimeographed pages, 8½ x 11 in., and is bound in durable paper. The price is 50c., postpaid anywhere in the United States; 75c. elsewhere.

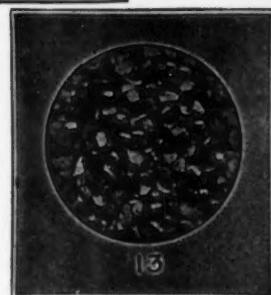
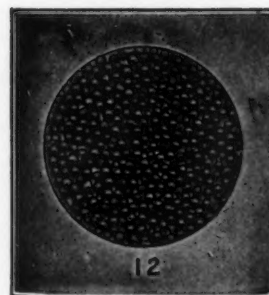
On the Assembly Line

(CONCLUDED FROM PAGE 54)

be built later if plans materialize. The building site is a 35-acre tract just outside the Owosso city limits.

Engineers Building for Detroit

Detroit engineers announced last week that within 60 days work will be started on an Engineers Building to occupy a full city block in the vicinity of the Detroit Art Institute. The project is announced by the Engineering Society of Detroit and James W. Parker, its president. The Engineers Building, designed as a model office and work building for engineers and architects and as a headquarters for engineering clubs and societies, will be built in connection with a structure to be used by the University of Michigan. The Engineers' Building will be separate. A kitchen, dining room, junior recreation rooms, library and conference rooms will be included. There will be a small auditorium (capacity 300) in the Engineers' Building and a 1000-seat auditorium to be used jointly by the engineers and the university.



DOLLARS Saved Daily

Since the introduction of our
Heat-Treated Steel Shot

And

Heat-Treated Steel Grit

Consumers are saving

10 per cent
15 per cent
25 per cent

Metal blasting faster.

Metal blasting cheaper.

Metal blasting with a better finish than ever before.

Our large, modern plant produces only heat-treated abrasives—uniform quality the year round.

A month's run of our shot or grit in your machine will prove the above statements.

Send us samples of the sizes you use; test our product in your own machine and save money.

A ton or a carload.

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Corporation

MANCHESTER, NEW HAMPSHIRE

We Never Compromise With Quality

Government Steel Orders Total \$454,337

WASHINGTON — Government contracts for iron and steel products, as reported by the Labor Department's Public Contracts Division for the week ended June 10, amounted to \$454,337. For non-ferrous metals and alloys contracts totaled \$206,707; for machinery contracts totaled \$276,464 during the same period. Details follow:

Iron and Steel Products

Cyclone Fence Co., Mineola, Long Island, chain link fence	\$10,807.77
Bethlehem Steel Co., Bethlehem, Pa., liner forgings	103,496.40
Crucible Steel Co. of America, New York, rudder stock	39,887.00
Russakov Die Casting Co., Chicago, bombs, miniature practice	36,000.00
Bantam Bearings Corp., South Bend, Ind., paths, roller	21,080.00
Messinger Bearings, Inc., Philadelphia, paths, roller	49,383.00
Otis Elevator Co., Buffalo, steel castings	17,955.92
Strong Steel Foundry Co., Buffalo, steel castings	20,691.00
Struthers Wells-Titusville Corp., Titusville Forge Division, Titusville, Pa., steel forgings	48,494.00
The Shelt Co., Elmira, N. Y., corrugated iron pipe	13,950.00
Alan Wood Steel Co., Conshohocken, Pa., steel, plates, sheets	17,398.50
The Hart Mfg. Co., Louisville, Ky., ranges, heating stoves	10,636.12
Bethlehem Steel Co., Pottstown, Pa., fabricated structural steel	13,917.50
Tippett & Wood, Phillipsburg, N. J., nun buoys	15,254.62
Bethlehem Steel Co., Bethlehem, Pa., pig iron	23,536.00
John Simmons Co., New York, oil and gasoline interceptors	11,849.35

Non-Ferrous Metals and Alloys

Isle Royale Copper Co., New York, copper	\$45,000.00
Calumet & Hecla Consolidated Copper Co., New York, copper	105,525.00
Federated Metals Division, American Smelting & Refining Co., New York, zinc	31,756.13
Baker & Co., Inc., Newark, N. J., lingual bars	10,850.00
Phister Mfg. Co., New York, fire extinguishers	13,576.72

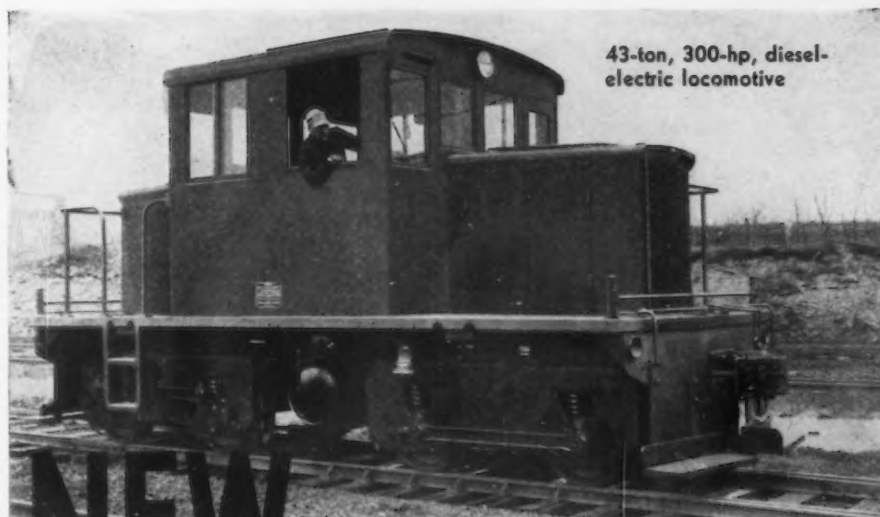
Machinery

Ingersoll Rand Co., Washington, air compressors	\$35,400.00
Hall-Scott Motor Car Co., New York, engines, marine	85,853.98
Gisholt Machine Co., Madison, Wis., turret lathe	10,864.00
Cincinnati Milling Machine and Cincinnati Grinders, Inc., Cincinnati, milling machines	33,938.00
H. R. Krueger & Co., Detroit, broaching machine	13,041.00
Tidewater Supply Co., Inc., Norfolk, Va., planer	20,140.00
Buffalo Pumps, Inc., Buffalo, pumps, centrifugal	Indefinite
Lidgerwood Mfg. Co., Elizabeth, N. J., towing machine	48,853.00
Harnischfeger Corp., Milwaukee, crane	11,370.00
Philadelphia Coppersmithing Co., Philadelphia, rum distillation unit	17,000.00

Sloss-Sheffield Coal Miners Return to Work

BIRMINGHAM — Sloss-Sheffield Steel & Iron Co. reached an agreement with their coal miners last week and work was resumed in the company's coal mines, idle since March 31.

They're Sure-fire Cost-cutters



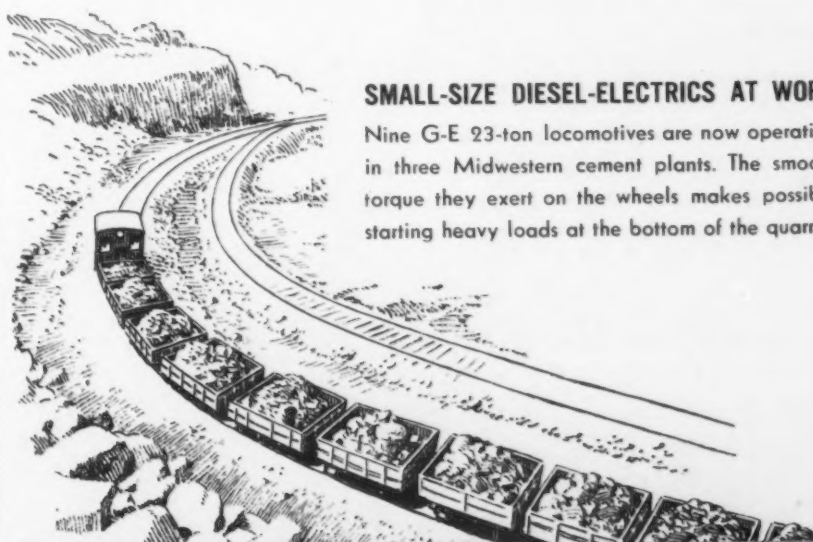
43-ton, 300-hp, diesel-electric locomotive

NEW SMALL DIESEL-ELECTRICS

THEY save money in fuel and maintenance costs. They reduce wear on cars and track because they run smoothly. They are easy to handle because of the simple electrical control. They are available for work most of the time. And now you can get them at the lowest prices in diesel-electric history.

General Electric has built a large number of these locomotives in the larger sizes for both railroad and industrial switching work, and the operating data obtained show that in most cases they pay for themselves in a remarkably short time.

Why not investigate the savings possible in hauling or switching work with our small-size diesel-electrics. Call the nearest G-E office and one of our representatives will be glad to talk this over with you. General Electric, Schenectady, N. Y.



SMALL-SIZE DIESEL-ELECTRICS AT WORK

Nine G-E 23-ton locomotives are now operating in three Midwestern cement plants. The smooth torque they exert on the wheels makes possible starting heavy loads at the bottom of the quarries

GENERAL  ELECTRIC

250-37

... THE NEWS IN BRIEF ...

Automobile assemblies gain sharply after Briggs strike settlement, totaling 78,305 last week, while sales volume for most companies pursues a steady pace for this time of year.—Page 52.

Free trips to World's Fair given to Jenkins contestants.—Page 69.

New Deal is cooking up new spending schemes aimed to aid both durable goods and consumer goods industries.—Page 56.

Purchases of railroad equipment on large scale are considered.—Page 56.

J. L. Perry, F. D. Bell to assist in distribution of war educational orders.—Page 58.

Industrialists tell Senate Education and Labor Committee that the Wagner Act and the Labor Board have interrupted years of satisfactory labor relations.—Page 59.

More contracts awarded by Navy Department.—Page 60.

Australian iron and steel exports showing rapid expansion.—Page 61.

Roosevelt signs order giving Procurement Division greater authority to buy for Government departments.—Page 61.

Government to spend \$25,000,000 for strategic materials in fiscal year beginning July 1.—Page 62.

Vacations with pay have grown rapidly in industry, Bureau of Labor Statistics reports.—Page 62.

Pennsylvania asks steel rate extension.—Page 63.

War Department will place additional orders totaling \$14,250,000 in fiscal year beginning July 1 if Congress approves supplementary military appropriation bill.—Page 63.

Blueprint reading course for welders.—Page 64.

Government steel purchases for latest reported week total \$454,337.—Page 65.

Sloss-Sheffield coal miners return to work.—Page 65.

Recreational activities for workers are appraised at a Chicago meeting as desirable for fostering better employee relations.—Page 68.

Private building construction is expanding, according to the F. W.

Dodge Corp., which reports that May figures were 25 per cent over the same month last year.—Page 69.

Fansteel Metallurgical Corp. sales for first five months of 1939 were 92.2 per cent over sales in the corresponding period last year.—Page 70.

Cleveland Graphite Bronze Co. acquires former plants of Great Lakes Aircraft Co. for occupancy.—Page 70.

E. T. Weir blames steel industry, not buyers, for price cutting.—Page 70.

Carpenter Steel Co. celebrates its first half century of progress.—Page 71.

Malleable Founders Society to meet June 23 and 24 at the Westchester Country Club, Rye, N. Y.—Page 72.

Patterson Foundry & Machine Co., East Liverpool, Ohio, is spending \$80,000 for new machinery.—Page 73.

Lebanon strike settled without restoring pay cut.—Page 73.

New book on machine design.—Page 73.

United States Bureau of Standards reports manufacture of iron 99.99 per cent pure.—Page 73.

China's tungsten exports drop in first quarter.—Page 74.

British in House of Commons criticize prices paid for United States scrap.—Page 74.

British need more scrap than mills can afford.—Page 75.

Thomas Truck & Caster Co. buys William H. Sipper Corp.—Page 75.

No profit sharing bill expected in Congress as a result of lengthy report on subject.—Page 78B.

Allis-Chalmers strike settled on an open shop basis. Union denied the checkoff.—Page 78C.

Further agitation to limit exports of steel scrap in Washington, but no new bill has been introduced.—Page 78C.

United States exports of machinery to Greece increase despite Reich's exemption from quota restrictions.—Page 78D.

Farrel-Birmingham Co. honors 130 workers of 25 to 60 years' service.—Page 78D.

Monarch Machine Tool Co., Sidney, Ohio, will formally open new factory and office building, June 24 and 25.—Page 78E.

Cold Metal Process Co. wins Steckel mill patent suit against United States Steel Corp.—Page 78F.

Tell Berna speaks before Elmira, N. Y., tool engineers.—Page 78G.

National Association of Manufacturers suggests 11 revisions of the Wagner Act.—Page 78G.

Foreign orders in machine tools again show an increase, while domestic orders this month are disappointing.—Page 95.

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MEETINGS

- June 26 to 30—American Society for Testing Materials, Atlantic City, N. J.
- July 10 to 15—American Society of Mechanical Engineers, San Francisco.
- Aug. 28 to 31—American Mining Congress, Salt Lake City.
- Sept. 20 to 22—National Industrial Advertisers Association, New York.
- Sept. 26 to 29—Association of Iron and Steel Engineers, Pittsburgh.
- Oct. 5 to 7—Society of Automotive Engineers, aircraft production meeting, Los Angeles.
- Oct. 16—Society of Automotive Engineers, annual dinner, New York.
- Oct. 23 to 27—National Metal Congress, Chicago.

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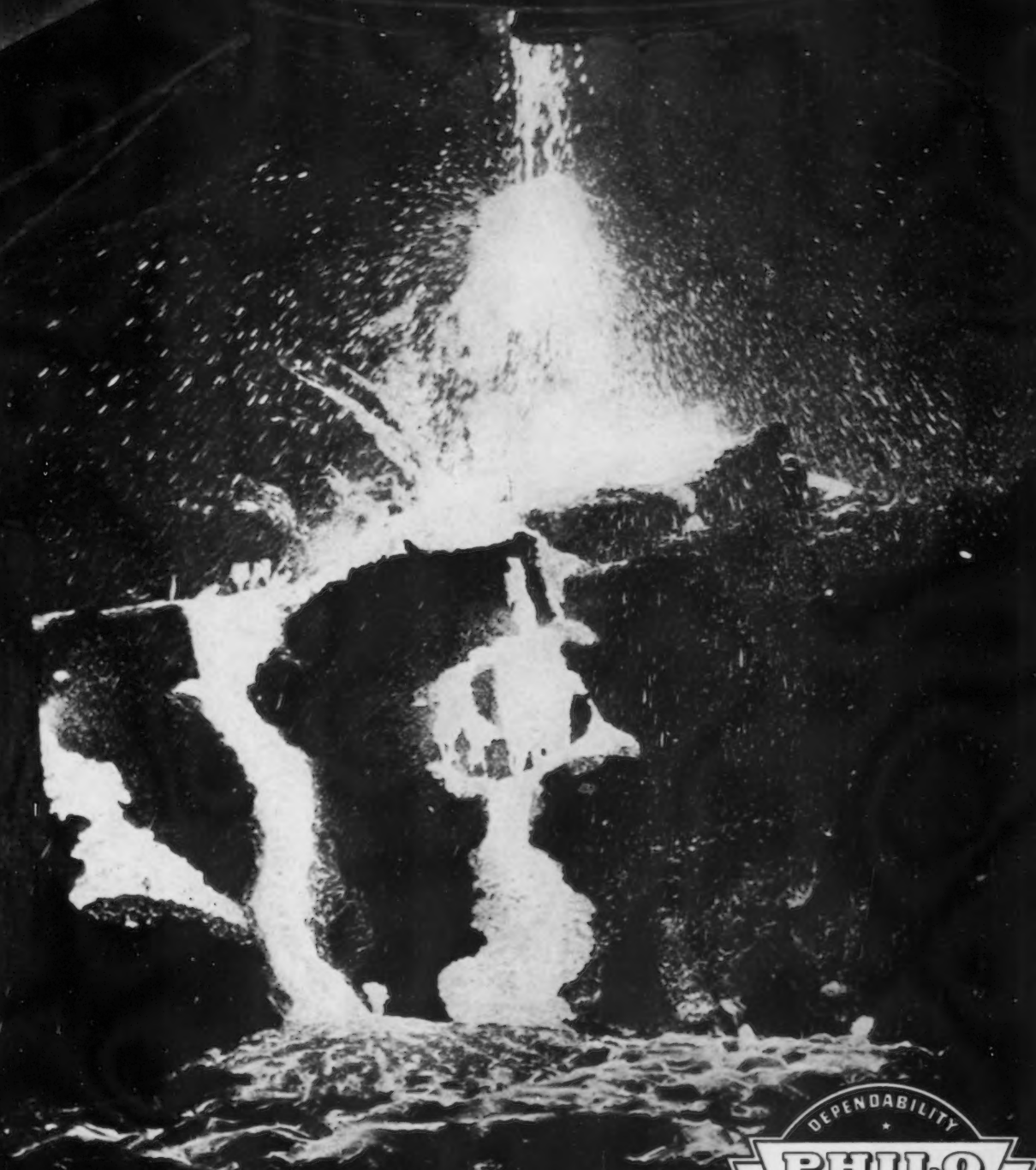
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Ohio Ferro-Alloys Corporation
Canton, Ohio

Recreational Activities for Workers Foster Better Employee Relations

CHICAGO—Several thousand personnel officials and other interested persons representing nearly 600 industrial plants attended the meeting in Chicago last week of the Chicago Regional Conference on Industrial Recreation, held under the auspices of Northwestern University.

Unusual mainly because its entire purpose was to discuss the various ways of disposing favorably of the increased leisure time brought to labor by wage and hour legislation, the conference was out of the ordinary also in that it formed a common meeting ground for management and em-

ployee, and for the AFL and the CIO, all groups being represented.

At the meeting of the industrial and factory division, at which George B. Waterstraat, president of the Industrial Management Society presided, representatives of various companies, including Western Electric Co., Owens-Illinois Glass Co., Chrysler Corp., and the Edison General Electric Appliance Co., told of the organization administration and financing of employee recreational activity.

The most popular sports in every instance were soft ball, bowling, golf, basketball, horseshoe pitching, and hard ball. Some plants involved in the discussion financed their employees' recreation, others did not. In nearly every case, however, somewhere along the line, either directly, or through employee associations to which company money was contributed or otherwise allotted, the companies gave some measure of assistance to the various recreational activities. In some instances, club rooms were provided, and in others, the equipment was furnished.

The question was raised as to whether such sponsorship worked in favor of the company in times of labor stress. James Walsh, director of recreation, Chrysler Corp., Detroit, believed that the average company starting a recreation program during the depression did not do so with the idea in mind of keeping unionization out of the plant. In the case of the Chrysler Corp., Mr. Walsh said that the program was set up because the people were not working, and they wished to provide them with some outlet. He pointed out, however, that a better feeling among employees and between management and labor would naturally result from such a sports program.

Other recreational activities mentioned were varied clubs and hobby groups, and indoor sports such as table tennis, quoits, cards, etc.

Interest of the unions in this subject was expressed by Dr. John A. Lapp, president of "A Better Chicago League," educator and labor mediator. Dr. Lapp said that the labor organizations were fostering three major lines of self-improvement, recreational opportunities, vocational improvement and general educational advancement. The present labor movement, he said, has as its chief objective, the strengthening and uplifting of the employee as a worker and as a man.

The cultural aspect of leisure time was discussed by Carl Roden, director

CLEVELAND TRAMRAIL

OVER HEAD HANDLING EQUIPMENT FOR ALL TYPES OF CLEANING AND PICKLING



● Handling Cost is the largest item of many manufacturing processes. Raw material, to-storage, to processing or the product through the various processes must be handled. Cleveland Tramrail has been successfully adapted to these handling problems in many industries. The one illustrated here - Cleaning Enamel Ware Blanks, prior to enameling, is via a hand propelled carrier with motor operated hoist, rope controlled.



CLEVELAND



TRAMRAIL

THE CLEVELAND CRANE & ENGINEERING CO.

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WICKLIFFE, OHIO.

Or Consult Your Phone Directory under Cleveland Tramrail

of the Chicago Public Library, who declared that if companies would provide space and supervision, the library would furnish the books. Workers, Mr. Roden found, are mainly interested in books dealing with recreational activities and technical subjects pertaining to their jobs. Some 62 Chicago industrial plants already have libraries, which are in effect branches of the main library, according to Mr. Roden.

In a short time the conference directors will have ready for publication a breakdown of the recreational facilities and policies of 381 Chicago companies, including makers of agricultural implements, iron and steel, automobiles and parts, machinery and dies, metal products, and electrical equipment.

Free Trips to World's Fair Given to Jenkins Contestants

JENKINS BROTHERS, New York, makers of valves for 75 years, have concluded an anniversary contest among their distributors in which seven prizes were awarded to those who had found the oldest Jenkins valves in service in their territories. Each winner will receive a trip for two persons to the New York World's Fair by airplane with all expenses paid for six days. One successful contestant who lives in New York will receive a trip to Montreal, Quebec and Nova Scotia. Prize winners and the districts they represent are as follows:

Atlanta: William G. Archer, Fulton Supply Co.; Boston: Malcolm Curry, Curry Brothers Oil Co.; Louisville: Allen Straub, Louisville Mill Supply Co.; Denver, Colo.: John M. Holland, Hendrie & Bolthoff; Rochester, N. Y.: B. Cushman, Barr & Greelman; Richmond, Va.: F. Greaner, James McGraw, Inc.; New York: William Freitag, Bernard-Greenwood Co.

Construction Expanding; 25% Over Last Year

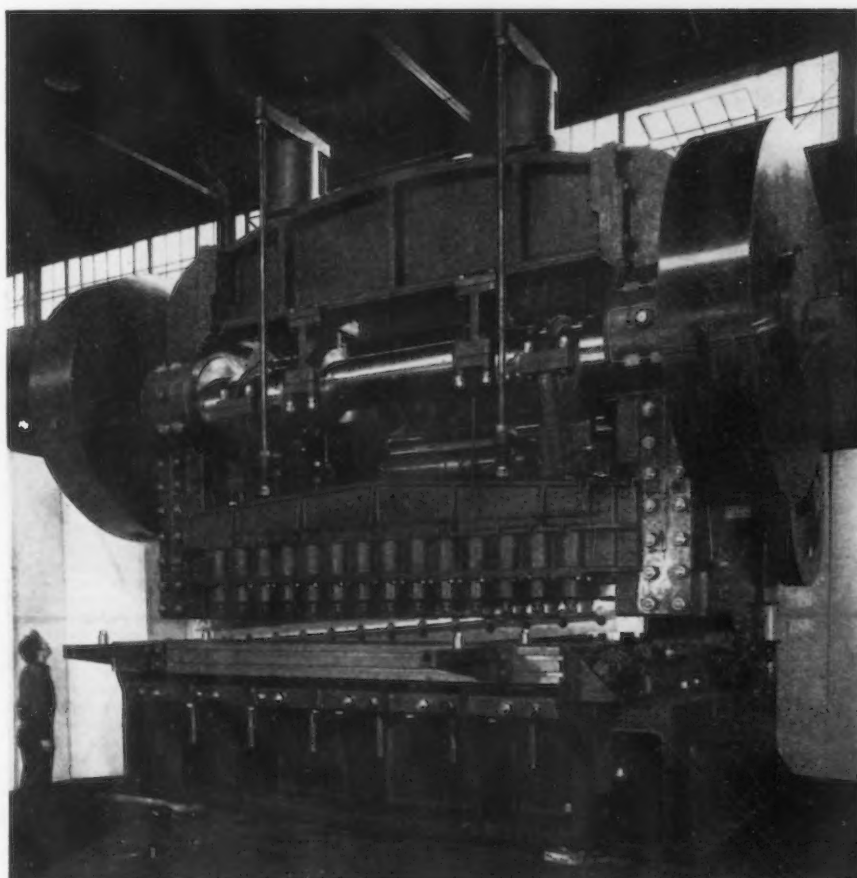
NEW construction and engineering work undertaken during May attained the highest level for any May since 1930. Total contracts for May, 1939, amounted to \$308,487,000 for the 37 Eastern states, according to F. W. Dodge Corp. This total represents a gain of 9 per cent over May of last year, but shows a decline of 7 per cent from April of this year.

According to Thomas S. Holden, vice-president in charge of the statis-

tical and research division of F. W. Dodge Corp., the most significant development in the May contract record occurred in private construction which has shown marked increases since the beginning of this year. Mr. Holden stated that privately-owned construction for May totaled \$173,730,000, which was 25 per cent ahead of last year and 2 per cent above the April, 1939, figure. For the first five months of this year, this class of construction is 36 per cent ahead of the same period last year. With the final passage of

the amendments to the National Housing Act, the confusion and uncertainty existing this spring should now permit private construction to proceed at a pace well ahead of last year.

May contracts for total building, comprising residential and non-residential work, amounted to \$210,567,000 as compared with \$209,061,000 for April and \$160,924,000 for May of last year. Contemplated projects for all classes of construction totaled \$414,486,000 for May.



The World's Largest Plate Shear carries a THOMAS nameplate

Designed by Thomas engineers and built in the Thomas shops, this Plate Shear was recently delivered to an export customer. Of cast steel construction throughout, the shear has a capacity for cutting plates up to 2½" thick by 13' 6" wide in ordinary steel.

In addition to many other design refinements on the machine, the Timken equipped flywheel shaft carries a newly developed magnetic clutch which permits stopping the ram at any point of the stroke

and also allows "inching" the ram down for cutting to a mark.

If you use shears of any type, Thomas engineering facilities are available to you in suggesting designs and features best adapted to your needs. Let us know your requirements.

THOMAS
MACHINE MANUFACTURING COMPANY
(Thomas Spacing Machine Co.)
PITTSBURGH, PA.

E. T. Weir Blames Steel Industry, Not Buyers, for Price Cutting

IN an interview with the *Pittsburgh Press*, which has been reprinted in many other newspapers, Ernest T. Weir, chairman of the National Steel Corp. and new president of the American Iron and Steel Institute, laid the blame for recent price cutting on the steel companies themselves and not on the buyers of steel.

Mr. Weir declared that the industry cannot continue to operate at a loss and maintain present wage scales and operating expenses, yet he said he was not in favor of cutting wages. "It would not help the situation," he said, adding that "Wages can stay where they are and companies can still make profits if they only knew it."

Responsibility for the recent price conditions cannot be placed on high wages or pressure from buyers or on production costs, said Mr. Weir. He wondered why stockholders have not voiced protests against continual deficits.

The automobile companies were not to blame for the break in prices, he declared. "Prices should never have been reduced to the point where profits were forgotten. The steel business is like any other — there must be a selling price that covers production costs and expenses and profits."

Discussing the future of the steel industry, Mr. Weir remarked:

"It is strange that the industry should be suffering difficulties when it is better fitted at this time to serve the country's needs than ever before. Capacity has been boosted to the highest point in history and plants are in better physical shape than they have been for a long time.

"We are in a better position to go ahead than perhaps at any previous time."

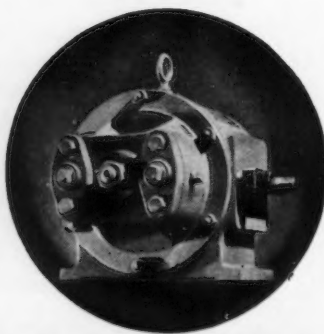
CUSHIONING EFFECT



HELE-SHAW Fluid Power HAS IT!

What a catcher's mitt does to absorb the thumping of a baseball well illustrates the cushioning effect of Hele-Shaw Fluid Power on machine drives. The oil used as the Fluid Power medium in Hele-Shaw Pumps is in itself a shock absorber. Excess shocks are readily relieved through valves, saving your equipment from undue stresses and strains or possible breakage. Before you design, build or buy machinery, see if you can't prolong its life and save money by driving with Hele-Shaw Pumps. Also ask us about the many other practical, usable benefits of Hele-Shaw Pumps and Fluid Power. We'll work with you every step of the way.

Other A-E-CO Products:
Lo-Hed Hoists, Taylor Stokers,
Marine Deck Auxiliaries.



A-E-CO
Hele-Shaw
FLUID
POWER

AMERICAN ENGINEERING COMPANY

2410 ARAMINGO AVENUE, PHILADELPHIA, PA.

Cleveland Graphite Bronze Purchases Another Plant

CLEVELAND—Cleveland Graphite Bronze Co., which manufactures bushings, steel backed babbitt lined bearings, and washers, has purchased the property formerly occupied by Great Lakes Aircraft Co., here, and will transfer its operations there ultimately.

The present main office and plant are on East 72d Street. The new property is on St. Clair Avenue, several miles farther east of the downtown district. At one time it was occupied by the Glenn Martin Co., maker of bombing planes. New buildings will be required.

Fansteel Sales Show Substantial Increase

NET sales of Fansteel Metallurgical Corp., North Chicago, Ill., for the first five months of 1939 are 92.2 per cent in excess of net sales for the corresponding period of 1938, according to Robert J. Aitchison, president. "A large portion of this increase is due to quickened activity in the automotive industry, to which we furnish electrical contacts for ignition, voltage regulators, horns and vibrators," said Mr. Aitchison.

First Half Century of Progress Celebrated by Carpenter Steel

CARPENTER STEEL CO. in June is celebrating the 50th anniversary of its founding at Reading, Pa. To this company went the honor of making for the Government the first armor-piercing projectiles made (1890) in this country.

On the eve of the Spanish-American War the Carpenter plant was established as a maker of projectiles, then the largest factory of its kind in the world, and in 1898 furnished 27,000 projectiles, some of which were used in Admiral Dewey's victory at Manila Bay.

When the chrome-nickel steel used in wartime was diverted to peacetime uses, it was the pioneer automobile industry, then centered in New England, which offered a new market for the Carpenter organization. When Wilbur and Orville Wright pioneered in aircraft transportation, it was Carpenter steel that went into the building of their first plane. In 1926 Admiral Richard E. Byrd and Floyd Bennett circled the North Pole in a Fokker plane containing many vital parts of Carpenter steel, and little more than a year later, Charles Lindbergh piloted the "Spirit of St. Louis" across the Atlantic, the plane powered by a Wright engine made largely of Carpenter steel.

Sketches Leading Officials

These and other interesting facts concerning the development of the Reading company appear in a booklet called "Fifty Years of Progress," a historical sketch of the company written by Earl M. Brumbach, of its wire mill inspection department.

The booklet, published for employees, lists outstanding officials of Carpenter Steel over a half century and notes that Fred A. Bigelow, now president, began his business career in 1892 as chemist with the Spaulding & Jennings Steel Co., Jersey City, N. J. He became salesman in New England, salesman in Cleveland, general sales manager, vice-president, and then president (on Sept. 7, 1920).

J. Heber Parker, vice-president of Carpenter Steel, entered the company's employ as assistant in the chemical laboratory under Dr. George W. Sargent, well known metallurgist, during college vacations in 1903 and 1904. After being graduated from Cornell University Mr. Parker returned to Carpenter Steel, became an assistant

superintendent in 1906 and in 1910 succeeded Dr. Sargent as metallurgist. He was appointed vice-president on Aug. 7, 1916.

Joseph S. Pendleton, secretary and treasurer, started his career with the company in 1897 as a chemist. He has held various positions in his 42 years

of service, becoming secretary on Sept. 7, 1917.

On June 1, the Carpenter company, which has 101 employees of more than 25 years' service, celebrated its golden jubilee at a banquet in Reading.

Production Machine Co., manufacturer of grinding, polishing and finishing machinery, Greenfield, Mass., has purchased the Francis Reed Co., Worcester, Mass., a maker of sensitive drilling machines, manufacturing drills under the Reed and formerly the Barr trade names.



Saved..SIGHT..JOB..MONEY by "Greenfield" Gages

Aging eyes could no longer read micrometer measurements of .0002" — the prescribed tolerance on ground spindle ends. So a "Greenfield" gage engineer proposed limit snap gages and appropriate setting plugs to replace the old measuring methods, and saved a job for a faithful worker. The company saved, too, for the new snap gages provided faster and more accurate control of size.

If you want rapid and accurate inspection "Greenfield" gage engineers can help you. Even if results are not as dramatic as in this instance, they will be fully as pleasing, financially.

GREENFIELD TAP & DIE CORP. • Greenfield, Mass.

Detroit Plant: 2102 West Fort St. • Warehouses in New York, Chicago, Los Angeles and San Francisco. In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ontario

GREENFIELD



Malleable Founders to Meet June 23-24 at Rye, N. Y.

THE Malleable Founders' Society will hold its annual meeting Friday and Saturday, June 23 and 24, at Westchester Country Club, Rye, N. Y. Technical sessions will be held each morning, with afternoons and evenings devoted to social events.

A full program has been arranged for this meeting, and features of it will be two guest speakers. Stanley

A. Knisely, director of advertising, Republic Steel Corp., and president, National Industrial Advertisers' Association, will speak to the convention on "Industrial Sales Promotion."

"Necessity for Understanding Men, and Where Do We Go From Here" is the title of the address which will be delivered by Sherman Rogers, former editor, *The Outlook Magazine*, and now speaker for the American Foundation, New York.

Technical subjects will be discussed

by Prof. Enrique Touceda, Rensselaer Polytechnic Institute, consulting engineer for the Malleable Founders' Society, and James H. Lansing, shop practice engineer.

The Friday morning session will be addressed by Mr. Lansing on results of the sand survey and the summer technical training course; Leon J. Wise, Chicago Malleable Castings Co., on research and product improvement; John A. Wagner, Wagner Malleable Iron Co., Decatur, Ill., on revision of the cost manual; Anthony Haswell, Dayton Malleable Iron Co., Dayton, Ohio, on hourly earnings and the work week.

The Saturday morning session will be addressed by Prof. Touceda, discussing action of lead on malleable iron, effect of phosphorus at sub-zero temperatures and specific values of tensile properties. Federal legislation and the Washington situation will be discussed by Arthur F. Jackson, Michigan Malleable Iron Co., Detroit, and Robert Belt, secretary of the association.

Publicity and market development will be treated by E. E. Griest, Fort Pitt Malleable Iron Co., Pittsburgh, and James L. Cawthon, Jr., development engineer of the society.

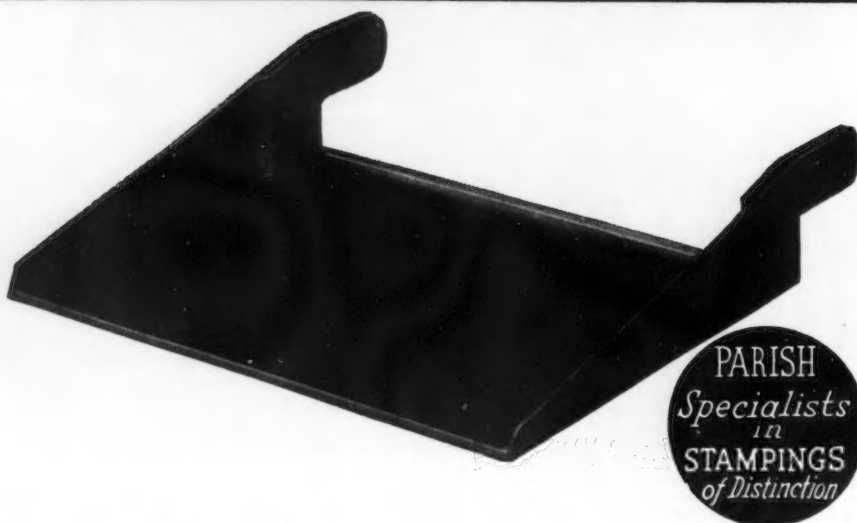
The Malleable Founders' Society announces the opening, June 26, of an eight weeks' intensive technical training course at Rensselaer Polytechnic Institute, Troy, N. Y. The course is open to employees of the member foundries of the society only, according to announcement by Robert E. Belt, executive secretary.

Purposes of this undertaking, first of its kind ever attempted by the society, are product betterment in the malleable industry and to provide an opportunity for young men in the industry to become thoroughly versed in the basic technology of production.

The course will be under the direct supervision of Doctor Hunter, head of the department of metallurgy, with Professors Mackay, Jones and Sullivan assigned to full time participation in instruction.

Some of the instruction will be done by Prof. Enrique Touceda, emeritus head of the department of metallurgy, R.P.I., and for the past 25 years consulting engineer to the Malleable Founders' Society. Those subjects most closely related to shop operations will be covered by James H. Lansing, shop practice engineer for the society.

HE WANTED IMPROVEMENT



THE inclinator step illustrated is of pressed steel $\frac{1}{8}$ " thick; 15" x 15 $\frac{1}{2}$ " x 3 $\frac{3}{8}$ " high. The welded end lugs provide the necessary strength, at less cost than is feasible by any other method.

This is typical of what Parish engineers are able to accomplish, by a skillful combination of stamping and welding, to provide better parts of improved appearance and lowered final cost.

Whether the stamping be simple or complicated, large or small, complete as it comes from the press or involving building up thru other operations, we welcome the opportunity to discuss the problem with you.

PARISH PRESSED STEEL CO., READING, PA.

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal.

Patterson Foundry Spending \$80,000 for Machinery

EAST LIVERPOOL, Ohio—Richard L. Cawood, president of the Patterson Foundry & Machine Co., here, has announced a program of plant improvements to be carried out during the summer.

At the machine division approximately \$50,000 is being spent on new machine tools to be used mostly in the manufacture of the company's line of mixers, while at the Porox division approximately \$30,000 is being spent on additional machinery for the manufacture of porox grinding balls and for modernization of the drying system at this plant. Work has already been started on these improvements.

Lebanon Strike Settled Without Restoring Pay Cut

LEBANON, PA.—The Lebanon Steel & Iron Co. has reached an agreement with the workers following a strike which closed its plant for one week. The strike was brought about by the refusal of the company to restore the wage reduction which was put in effect in March, 1938. The men voted to return to work without restoration of the pay cut.

New Book on Machine Design

BASIC fundamentals of theory and analysis as well as of factual information for the prospective designer are given in a new book on "Machine Design," by Stanton E. Winston, associate professor of mechanical engineering, Armour Institute of Technology, published by the American Technical Society, Drexel Avenue at Fifty-eighth Street, Chicago.

It is assumed that the reader has completed the subject of mechanism and that his mathematical knowledge extends only through trigonometry and logarithms. Actual examples worked out in detail are included throughout the text. The book contains 333 pages, 5½ x 8¼ in., 145 illustrations and 26 tables. Chapter headings are as follows: Fundamental Principles of Simple and Compound Stresses; Bolts and Screws; Cylinders and Riveted Joints; Shafting and Keys; Couplings and Clutches; Wrapping Connectors and their Pulleys, Sheaves, or Sprockets; Friction Drives and Spur and Bevel Gears; and Miscellaneous Details of Design. The price of the book is \$3.

Standards Bureau Reports Making of Iron 99.99% Pure

THE Department of Commerce has announced today that several one-pound ingots of unusually pure iron were recently prepared in the metallurgical division of the National Bureau of Standards. Spectroscopic and chemical examination of the samples revealed that the total impurities in each of the ingots was 1/100th of 1 per cent. Most of the impurities

contained in this small total were non-metallic, made up chiefly of oxygen and sulphur, with traces of carbon, phosphorus, nitrogen, and hydrogen. Supply of the metal is so limited that it will only take care of the bureau's needs for work already planned and samples cannot be furnished to other laboratories, the Commerce Department announced.

United States Rubber Co.'s Detroit branch has moved to 5850 Cass Avenue.

FARREL-SYKES GEARS

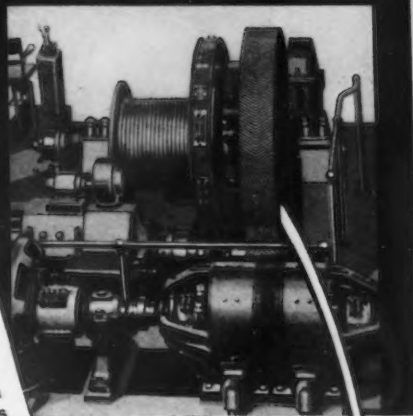
Meet the Hardest Demands of Power Shovel Service

In many Marion Power Shovels Farrel-Sykes Gears have been operating from six to eight years, twenty-four hours a day, without giving the slightest trouble. These gears operate continuously as part of the hoist mechanism when the machine is digging. They act as propelling gears when the shovel is moved.

In hoisting, the Farrel-Sykes Gears take a load varying from zero to maximum, six to ten times a minute. A single reduction of Farrel-Sykes continuous tooth herringbone gears makes the hoisting unit more efficient than when a double unit of one herringbone and one spur reduction is used.

The use of Farrel-Sykes Gears reduces to the minimum the space required in shovel design. They help assure smooth, quiet, rapid operation without breakdowns.

Engineering resourcefulness, precision manufacture and the inherent superiority of Farrel-Sykes Gears are responsible for the successful solution of this drive problem, just as they have been for a wide variety of other applications in every branch of industry.



View of part of operating machinery of Marion Type 4121 shovel, showing Farrel-Sykes single reduction continuous tooth herringbone gears.

FARREL-BIRMINGHAM COMPANY, INC.

344 VULCAN STREET, BUFFALO, N. Y.

British Criticize Prices for U.S. Scrap

LONDON—Questions regarding the shortage of steel scrap supplies and the high prices paid for scrap purchased from the United States and elsewhere were raised in the British House of Commons recently.

R. R. Stokes asked Oliver Stanley, president of the Board of Trade, if he was aware that the British scrap

merchants, who were refraining for patriotic reasons from exporting scrap which in many cases is their normal business, were being penalized by the British steel ring, which was buying scrap steel at a much higher price abroad than they would agree to pay their own countrymen for similar material. He also asked President Stanley whether he approved of the subsidy paid to the steel industry to help in its recovery being used in this way rather than being spent at home.

"There is an arrangement," replied President Stanley, "between the British Iron and Steel Federation and the Scrap Merchants' Federation under which the latter have agreed to offer the former all available scrap in this country at a price which is settled between the two bodies. Under this arrangement, material is sold for export only when it is not required for use in this country."

"In spite of this arrangement, domestic supplies of scrap have recently proved insufficient, and it has been necessary to negotiate purchases abroad. I am not aware of the price paid for imported scrap, or that the steel industry is receiving a subsidy."

Mr. Stokes then asked President Stanley if he was aware that under the present arrangement of the British Iron and Steel Corp. (commercial organization of the British Iron and Steel Federation) had virtually suspended some of the contracts with British scrap merchants and was purchasing scrap abroad at 50 per cent above domestic prices.

President Stanley replied that he was not aware that the corporation has suspended contracts for domestic scrap.

The suggestion made in Mr. Stokes's question that purchases of foreign scrap are being made at higher prices than are paid for British scrap is denied by the British Iron and Steel Federation. The British Iron and Steel Corp., it is asserted, is anxious to buy any scrap that may be offered it at the schedule prices. The British domestic market can produce only a certain quantity of scrap of adequate melting quality that can be economically collected. In the corporation's search for further supplies the United States has been found to be the cheapest market.

China's Tungsten Exports Drop in First Quarter

WASHINGTON—China's exports of tungsten ore have been sharply curtailed during the current year, according to a report from Consul H. H. Smith, Shanghai, made public by the Department of Commerce.

Foreign shipments during the first quarter of 1939 decreased to 4,753,117 lb., valued at \$1,531,366, compared with 8,616,900 lb., valued at \$3,979,829, in the first quarter of 1938 and 10,244,335 lb., valued at \$2,259,502



BRIGHT FINISH UNCOATED • ELECTRO COATED
IN ZINC • NICKEL • COPPER • BRASS • BRONZE AND TIN

MAKE FINISHED PRODUCTS
FROM ELECTRO COATED
STRIP STEEL



● Electro coated Thomastrip is cutting costs for many manufacturers. Through our special rolling and plating processes Nickel, Brass, Copper and other electro coatings *can be supplied economically* and will not crack or peel during forming operations. The exceptional quality of the coatings frequently eliminates further finishing operations.

Thomas processes achieve quality coatings for many requirements and solve the problem of finish by obtaining the desired quality at the least cost. Let us discuss your requirements and see if we have a definite economy to offer you.

THE THOMAS STEEL COMPANY • Warren, Ohio

SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

during the first three months of 1937. Until the latter part of 1937, Shanghai was the outstanding port of shipment for Chinese tungsten ore, accounting in 1937 for 23,292,922 lb. of China's total export shipments amounting to 36,415,142 lb. No tungsten ore was exported through the port of Shanghai in 1938 nor 1939. With Canton now under control of the Japanese, the report stated, it is to be expected that the Chinese National Government will endeavor to route future tungsten ore shipments via South China ports not occupied by Japanese or through Indo-China.

British Need More Scrap Than Mills Can Afford

LONDON—Reports from various British steel centers, embarrassed by the increasing scarcity of scrap, indicate that the steel makers are anxiously awaiting relief shipments from the United States. It is realized, however, that the British steel industry is at present unable to purchase U. S. scrap on the same scale as in 1937. As it cannot afford to do this, it is swinging to a greater use of pig iron.

When the big U. S. deals were first proposed the British steel concerns had to sign a legal document securing funds of £5,500,000 (\$27,500,000) to be raised from the banks. About £4,700,000 (\$23,500,000) of this was used to finance the previous big deals, and the arrangement was then closed. This money represents the difference between the price paid for imported scrap and the amount obtained from British consumers. It is being recovered by a levy of 6s. 6d. (\$1.62) per ton on ingot steel production and should be squared by July. The remainder of the fund covered by the original arrangement has been opened up again to provide for the deals negotiated this year, but it is obvious that the British steel trade cannot repeat its losses on the scale of 1937. An addition to the present levy or even its permanent continuance would, it is widely asserted, impose too severe a financial strain on the trade.

The industry has generally agreed to increase the proportion of pig iron used in furnace charges and, even when fresh American scrap supplies become available these will not all be distributed for immediate use. It is the official policy of the industry to build up scrap stocks again as a provision for the heavy demands to be made on the industry in the future.

Thomas Truck & Caster Co. Buys William H. Sippel Corp.

THE Thomas Truck & Caster Co., 3890 K Street, Keokuk, Iowa, has purchased the business of the William H. Sippel Corp., South Bend, Ind., manufacturer since 1925 of truck casters, floor trucks, industrial trailers, and skid platforms. The Sippel products will be combined with the Thomas line, and all production carried on in the Keokuk plant.

The machinery and equipment at South Bend has been installed in the Keokuk plant, increasing production facilities for building the larger line of products. The superintendent of the Sippel plant has joined the Thomas organization.

Maas & Walderstein Co., maker of industrial finishes, Newark, N. J., has moved the Chicago office from its old location and is now occupying a new building at 1658 Carroll Avenue, Chicago.



An Assist! By **ATLAS**
View at Prominent Iron Foundry
To Lower Costs!

Here Atlas-designed, Atlas-built equipment moves heavy scrap and other charging materials with consummate ease.

Monorail deposits empty bucket on roller conveyor. Bucket rolls down to scale platform, is charged with iron, weight read from yard crane cab. Scale platform lowers, turns, bucket rolls down to monorail for pick-up and charge to cupola.

A propitious circle, presaging profit at the year-end—and a definitely typical Atlas installation.

THE ATLAS CAR & MFG. CO.

Engineers

CLEVELAND, OHIO

Manufacturers

serving the world with mobile handling equipment

... PERSONALS ...

M. A. WILLIAMS has been appointed district sales manager in the Indianapolis territory for Republic Steel Corp. Mr. Williams has been in charge of Union Drawn Steel division sales in the same territory, having been made Union Drawn Steel Co. district sales manager there in 1927. The two positions will be combined.

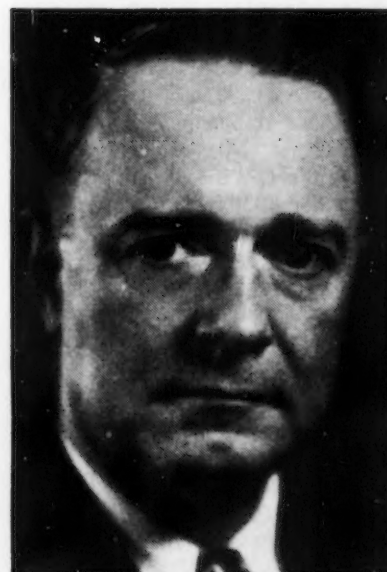
Mr. Williams entered the steel in-

dustry with the Cambria Steel Co., Johnstown, Pa., in 1911. In 1919 he joined the La Salle Steel Co., in Chicago, and later was associated with Bliss & Laughlin, Inc., Harvey, Ill.

S. G. DISQUE continues as assistant district sales manager.

♦ ♦ ♦

C. W. TRUST, traffic manager of Eastern district, U. S. Steel Corp., was



M. A. WILLIAMS, district sales manager in the Indianapolis territory for Republic Steel Corp.



No. 900 Sander and Grinder, 7" disc; 4600 R.P.M.; weight 15 lbs.; price—\$75.

Others ranging from No. 705, 8¼ lbs., Utility model, \$39.50 to No. 909, 20 lbs., Extra Heavy Duty Ball Bearing model, \$92.00.

Latest addition to the fine line of Millers Falls portable electric tools is Disc Sander and Grinder No. 900, extra heavy duty production tool. Powered for unbroken hours of tough going, it's remarkably easy to use — perfectly balanced, with comfortable, unbreakable plastic handles; air filter assures clean cooling. Ask us to arrange a free trial in your own plant; no obligation.

Know the whole unbeatable Millers Falls line: portable electric saws, hammers, drills, nut runners and screw drivers, grinders, and accessories. Write for Catalog 38.

MILLERS FALLS COMPANY

GREENFIELD



MASSACHUSETTS

elected president of the Traffic Club of Pittsburgh at the annual election held recently. Mr. Trust began his career with the Pennsylvania Railroad, later worked for the Clairton Steel Co. which was absorbed by the U. S. Steel Corp. in 1904, and since that time has served in the traffic department of U. S. Steel.

Other officers elected by the Traffic Club were: M. C. RICHARDS, traffic manager, Spang, Chalfant & Co., first vice-president; C. C. DAILEY, general agent, Lehigh Valley Railroad, second vice-president; J. R. BARRY, general agent, Louisville & Nashville Railroad, third vice-president; DAVID F. WOODS, general agent, Chicago & Eastern Illinois Railway Co., secretary; and J. G. OWSTON, division traffic manager, Pittsburgh Plate Glass Co., treasurer.

ROBERT H. MILLER, general freight agent of the Pennsylvania Railroad, was elected a carrier member of the board of governors, and the following as industrial members of the board: E. C. JEPSON, general traffic manager, Wheeling Steel Corp.; JOHN B. KEELER, assistant general traffic manager, Koppers Co.; GENE SCHIFFER, traffic manager, Gulf Oil Corp., and JOHN H. WILHARM, traffic manager, Diamond Alkali Co.

♦ ♦ ♦

JOHN O. OUTWATER, who for many years represented the Steel Export Association of America in Europe, has recently opened an office at Brettenham House, 14-15 Lancaster Place, London, W.C. 2, England, where he



C. W. TRUST, Eastern district traffic manager of U. S. Steel Corp., who has been elected president of the Traffic Club of Pittsburgh.

is representing a few American steel companies in the sale of steel products in Europe.

♦ ♦ ♦

ANDREW B. HOLMSTROM, general manager of the Norton Co., Welwyn, England, plant on Sept. 1 will become works manager of the company's Worcester, Mass., plant. Mr. Holmstrom has been with the Norton Co. since 1920. He will succeed **HUGO H. W. BETH**, who will retire after 34 years' association with the company, but will continue as a consulting engineer. Mr. Holmstrom is a graduate of the Worcester Polytechnic Institute.

♦ ♦ ♦

R. G. TABORS, formerly located in the Philadelphia office of Baldwin-Southwark Corp., has been transferred to Chicago where he will head the sales activities of the Southwark division. A graduate of Case School of Applied Science, Mr. Tabors has been active in the development and sales of testing machines and hydraulic machinery manufactured by Baldwin-Southwark Corp.

♦ ♦ ♦

THOMAS W. and **JOHN C. PANGBORN**, of the Pangborn Corp., Hagerstown, Md., have donated to the city of Hagerstown a public park, which was formally dedicated on June 10.

♦ ♦ ♦

L. C. RICKETTS, general superintendent of the Harrison works of Worthington Pump & Machinery Corp.,

Harrison, N. J., has been appointed manager of that works. **W. D. SIZER**, who joined Worthington in 1920, has been made executive engineer in charge of engineering activities at Harrison. **B. R. MCBATH** becomes engineer in charge of the centrifugal engineering division, succeeding Mr. Sizer.

J. H. BRAUTIGAM succeeds **W. H. SCHERER** as manager of the Holyoke works. Mr. Brautigam joined the Holyoke organization in 1928, leaving

there to assume duties as assistant works manager of the Harrison plant in 1932. Mr. Scherer has been made assistant to **H. C. Ramsey**, vice-president in charge of operations, and will devote his entire time to the further development of manufacturing methods in all of the corporation's plants.

♦ ♦ ♦

K. K. KNAPP, Chicago, and **S. H. COHN**, of Gary, have been elected president and vice-president, respec-

MCKAY



Combination Forming and Edge Conditioning Machine

The forms shown illustrate the variety of shapes which can be rolled on the McKay Cold Roll Forming Machine.



Combination Forming and Edge Conditioning Machine, equipped with edge conditioning and truing rolls, for use with forming mills, is built with 2-speed drive and over-running clutches. For pull-through operation with tube mill the slow speed is used or it can be operated at the higher speed for use as a separate forming machine on light tubing and moldings.

Micrometer adjustment is a great aid in ease of setting roll pressures for different gauges of stock to be edged.

THE MCKAY MACHINE CO

ENGINEERS AND MANUFACTURERS OF SHEET, TIN AND STRIP MILL EQUIPMENT.
YOUNGSTOWN, OHIO

ASSOCIATED COMPANY

THE WEAN ENGINEERING CO., Inc. • Warren, Ohio

tively, of the Gary Land Co., a subsidiary of the United States Steel Corp. Mr. Knapp succeeds G. Cook KIMBALL, recently appointed executive vice-president of the United States Steel Corp. of Delaware. The new president has served the Gary Land Co. as vice-president and director and has been intimately connected with the organization since its inception. Mr. Cohn has been associated with the land company for more than 20 years and has served as property agent since Jan. 1, 1938. Mr. Kimball, the retiring president, continues on the board of directors.

♦ ♦ ♦

HARRY V. MERCER, advertising manager of the American Rolling Mill Co., Middletown, Ohio, was elected vice-president of the Porcelain Enamel Institute by the institute's board of trustees last week. Mr. Mercer, a member of the Armco organization for more than 20 years, has been closely associated with Porcelain Enamel Institute activities in recent years.

♦ ♦ ♦

JOSEPH A. DeLo, who has been identified with the Continental Steel

Corp., Kokomo, Ind., since 1932, has been appointed sales promotion and advertising manager of the company, succeeding the late F. W. Tufts. Previous to 1932, Mr. DeLo was engaged in newspaper work in Kokomo. He was graduated from Indiana University in 1929.

♦ ♦ ♦

LLOYD R. VIVIAN, advertising manager of the Ditzler Color Co., has been elected president of the Industrial Marketers of Detroit. THOMAS B. MOULE, of the Ex-Cell-O Corp., has been elected vice-president, LYLE D. WORDEN, of the Morse Chain Co., has been named secretary, and JOHN ASHBURNE, JR., Nash-Kelvinator Corp., has been reelected treasurer.

♦ ♦ ♦

E. D. HOLLINSHEAD has been appointed manager of real estate of Carnegie-Illinois Steel Corp. and will have charge of the sale and disposition of all surplus properties of Carnegie-Illinois Steel Corp., as well as the supervision, leasing and renting of all office space, including district sales offices. Mr. Hollinshead will also be in charge of all activities of Carnegie



HARRY V. MERCER, new vice-president of the Porcelain Enamel Institute. He is advertising manager of the American Rolling Mill Co.

Land Corp., The Conneaut Land Co. and Gary Land Co. Mr. Hollinshead, who formerly was in the Chicago office of Carnegie-Illinois handling the sale of surplus properties, will be located in Pittsburgh.

♦ ♦ ♦

MRS. EDWARD P. BURRELL, Cleveland, has donated \$65,000 to Baldwin-Wallace College, Berea, Ohio, to build and equip an astronomical observatory as a memorial to her late husband, Edward P. Burrell, who was chief engineer, Warner & Swasey Co., Cleveland, and designer of some of the world's largest astronomical instruments, including the Perkins observatory telescope of Ohio Wesleyan University and the McDonald observatory telescopes of the University of Texas.

♦ ♦ ♦

WELLWOOD E. BEALL has been promoted to the post of chief engineer of the Boeing Aircraft Co. Formerly Mr. Beall was engineer in charge of all commercial projects. Mr. Beall, the son of a metallurgical engineer, studied mechanical engineering at the University of Colorado, then attended the Guggenheim School of Aeronautics at New York University.

♦ ♦ ♦

JAMES E. GILLESPIE, for the past 12 years sales and advertising manager of the Richardson Boat Co. in Tonawanda, N. Y., has been appointed advertising and sales promotion manager of USL Battery Corp. at Niagara

*"when
springs
get in
your hair"*

**Let the Dunbar "Baldies"
come to the rescue ---**



You save time... often money... by delegating the design and manufacture of your springs to Dunbar specialists. Ninety-four years spent solely in the making of all sorts of springs.

DUNBAR BROS. CO.
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL CONNECTICUT
Quality Springs since 1845



JOSEPH A. DeLo, sales promotion and advertising manager of Continental Steel Corp.

Falls, N. Y. In his new position Mr. Gillespie will be responsible for the promotional activities of both USL and the Auto-Lite storage batteries. USL Battery Corp. is a division of the Electric Auto-Lite Co.

J. G. COUTANT, fuel consultant, has been appointed vice-president of Controlled Steam Generators, Inc., New York. He will be in charge of engineering work in connection with the design and construction of steam generators and the reconditioning of mill and industrial furnaces.

O. E. OSTROM, for the past 12 years identified with the Carnegie-Illinois Steel Corp., St. Louis, has joined the sales staff of the St. Louis branch of Steel Sales Corp., as sales representative in Missouri, Arkansas and southern Illinois.

At sectional meetings of the Malleable Founders' Society in the past few weeks the following have been elected directors of the society:

C. L. CARTER, president and general manager, Albion Malleable Iron Co., Albion, Mich.; **C. A. GUTENKUNST, JR.**, president, Milwaukee Malleable Gray Iron Co., Milwaukee; **W. V. TISCORNIA**, vice-president, Auto Specialties Mfg. Co., St. Joseph, Mich.; **JOHN A. WAGNER**, president, Wagner Malleable Iron Co., Decatur, Ill.; **ANTHONY HASWELL**, first vice-president, Dayton Malleable Iron Co., Dayton, Ohio; **A. F. JACKSON**, vice-presi-

dent and general manager, Michigan Malleable Iron Co., Detroit; **H. A. MARTI**, secretary-treasurer and general manager, Maumee Malleable Iron Co., Toledo; **C. H. McCREA**, manager, Cleveland works, National Malleable & Steel Castings Co.; **H. NELSON ALBRIGHT**, manager, Columbia Malleable Castings Corp., Columbia, Pa.; **L. A. DIBBLE**, president, Eastern Malleable Iron Co., Naugatuck, Conn.; **F. O. PARKER**, sales manager, Acme Steel Malleable Iron Works, Buffalo, and **F. C. TUTTLE, JR.**, manager, Belcher Malleable Iron Co., Easton.

EARL I. BEMENT, of the manufacturing manager's office, Murray Corp. of America, Detroit, has been elected president of the Detroit chapter of the Society for the Advancement of Management. **GUY J. BATES**, AC Spark Plug Co., Flint, has been elected treasurer and **DONALD J. SUBLETTE**, Detroit Civil Service Commission, has been elected again as secretary for the 1939-40 season.

C. E. WESTOVER, Burnside Steel Foundry Co., has been elected chairman of the Chicago chapter of the American Foundrymen's Association. Other officers elected were **G. P. PHILLIPS**, International Harvester Co., vice-chairman; **C. C. KAWIN**, C. C. Kawin Co., treasurer, and **L. L. HENKEL**, Interlake Iron Corp., secretary.

THOMAS N. BERLAGE, heretofore identified with the Standard Engineering Co. and the Shell Oil Co., has been appointed director of sales for the Corronizing division of the Standard Steel Spring Co., Coraopolis, Pa. He is a graduate of Massachusetts Institute of Technology.

N. N. SHEPHERD, formerly with the Carboly Co., has joined the Chicago sales engineering staff of the Firth-Sterling Steel Co., McKeesport, Pa. **CLIFFORD W. NITCHIE**, heretofore with Vascoloy-Ramet Corp., will also be identified with the Chicago office of the company.

LESLIE T. MCKINNON, who has been with the Braeburn Steel Corp., is to be steel sales representative in Detroit, and **GEORGE L. SHARPE** will be a Firthite sales representative also in Detroit. Mr. Sharpe was formerly with the Tungsten Carbide Tool Co. and with the Michigan Tool Co.

A. W. MCCOY, formerly with the Carboly Co. and the Union Wire Die Co., has been appointed sales engineer

in New York, succeeding **J. W. MORDICA**, who has been transferred to the home office. **F. H. BECKER** has been transferred from Detroit to Syracuse in a sales capacity.

LEONARD E. NICHOLS, formerly chief welding engineer for the National Electric Welding Machine Co., Bay City, Mich., has become technical adviser and sales engineer for the Detroit district sales division. Detroit offices of the company headed by **JULIUS R. BRUECKNER**, vice-president, have been moved from the Stormfeltz-Lovely Building to larger quarters in the General Motors Building.

G. W. HEWITT, production manager, blast furnace and coke works, Wheeling Steel Corp., Wheeling, W. Va., was elected president at the annual spring meeting of the Eastern States Blast Furnace and Coke Oven Association held at Pittsburgh recently. Other officers are: **H. W. SEYLER**, assistant general superintendent, by-product coke plant, Clairton, Pa., works, Carnegie-Illinois Steel Corp., vice-president; and **W. A. STEELE**, superintendent of blast furnaces, Crucible Steel Co. of America, Midland, Pa., secretary-treasurer.

EDWIN C. BARRINGER, executive secretary of the Institute of Scrap Iron and Steel, Inc., New York, will address a meeting of the Foremen's Association of Erie at the Y.M.C.A. Camp, west of Erie, Pa., at its annual summer conference, June 24. Mr. Barringer will describe the scope and operation of the scrap iron and steel industry and conduct a round table on practical scrap problems.

J. E. MACCLOSKEY, JR., was elected chairman of the board, Harbison-Walker Refractories Co., Pittsburgh, at a special meeting of the board of directors this week, succeeding the late **J. E. LEWIS**.

Mr. Lewis had been general counsel for the company for nearly 37 years.

H. R. CAMPBELL was elected a director of Harbison-Walker to fill the vacancy caused by Mr. Lewis' death. He also was named vice-president in charge of operations.

HARRY L. WILCOX, assistant chief engineer, Electric Controller & Mfg. Co., Cleveland, has been chosen treasurer of the Cleveland Engineering Society for 1939-1940 by the board of trustees.

... OBITUARY ...

ROBERT H. MADDOCKS, assistant to the general sales manager for the Central Iron & Steel Co., Harrisburg, Pa., died at his home in Jersey City on June 16 following a brief illness. He was 73 years old and had spent his entire career in the steel business, having started at the age of 15 with William H. Wallace & Co., then New York sales agents for Central. In 1914 the company opened its own office in New York and Mr. Maddock was



ROBERT H. MADDOCKS, who was assistant to the general sales manager of Central Iron & Steel Co.

made district sales manager, a position in which he continued until May, 1934, when he was appointed assistant to the general sales manager. His son, R. S. Maddocks, is manager of the New York Office of Central Iron & Steel Co.

ROLAND M. COOK, sales manager of the Worcester Pressed Steel Co., Worcester, and a director of the company, died on June 14 at the Memorial Hospital in that city of a heart attack. He was 45 years old. He received his bachelor's degree from Harvard University in 1917, and later was graduated from the Harvard Graduate School of Business Administration.

J. D. HARDCASTLE, vice-president of Spang, Chalfant & Co., Inc., died June 12 at Hollywood, Cal. Mr. Hardcastle had been associated with Spang, Chalfant for 35 years. He was 58 years old.

BERT J. FARR, general superintendent of motive power and car equipment of the Grand Trunk Western

Railroad for 18 years, was buried June 13 at Battle Creek, Mich. He had served as chief of motive power longer than any other railroad executive in the country and was the senior in the Canadian National System. He also had been in charge of railroad equipment during the building of the Panama Canal. He was 62 years old.



HERBERT L. BROWN, for many years active in the steel industry in Cincinnati, died at his home in West Chester, Ohio, near Cincinnati, on June 15. He was 56 years old and had been ill for some time. During his career, Mr. Brown held the position for many years of district manager of the Superior Steel Corp., Pittsburgh, and later was sales representative of the Columbia Steel & Shafting Co., Pittsburgh, and the Revere Copper & Brass, Inc., of Baltimore. During the World War he served with the rank of major as assistant to the chief of Ordnance Department in Washington.



L. S. MAREMONT, one of the original founders of Maremont Automotive Products, Inc., Chicago, died at his home on June 8, after a long illness.

No Profit Sharing Bill Expected in Congress

WASHINGTON—A 351-page report by a Senate Finance subcommittee on profit sharing systems for industry and incentive taxation was expected this week to result in no definite Congressional move to enact legislation. While the report on the 10-month study held that the sharing of profits with employees is "essential to the ultimate maintenance of the capitalistic system," it said with respect to incentive taxation that further exploration was necessary.

The study was made under a resolution by Senator Vandenberg, Republican of Michigan, after hearings had been held by a Senate Finance subcommittee headed by Senator Herring, Democrat of Iowa. Senator Johnson, Democrat of Colorado, declined to sign the report, protesting that he was not in accord with all of the conclusions.

One paragraph, interpreted as a direct slap at the Administration, included in the report, said:

"Until Government adopts a more cooperative attitude toward business

we can expect to see an indefinite period of business uncertainty, continued unemployment and semi-depression conditions."

The profit sharing idea was advanced by some members of Congress last session as a medium for promoting stabilized employment and planned expansion. Public hearings, however, developed testimony that labor was not in agreement with the plan and industry expressed the view that a system of incentive taxation would offer an opportunity for bureaucracy to discriminate between different taxpayers. Under the proposal, industries would be offered certain tax exemptions to induce them to adopt profit sharing.

Allis-Chalmers Strike Settled on Open Shop Basis

MILWAUKEE—The 24-day holiday and strike at the Allis-Chalmers Mfg. Co. ended on Saturday of last week when approximately 5000 members of the UAW adopted a new contract which resembled closely the 1938 agreement, offered by the management at the outset. The huge plant, the largest in Wisconsin, opened Monday morning with about 5000 of the 6500 production workers returning to their jobs. The remaining 1500 employees were called in a few days later.

Under the terms of the contract, which was voted on favorably by 97 per cent of the 5000 voters, the union was denied a union shop, the check-off and a blanket contract covering the Milwaukee, Boston and Pittsburgh plants. It was allowed to investigate complaints and to act in an advisory capacity to shop stewards, and can also bargain for wage increases during the contract life, but the company cannot reduce wages. The union must be consulted before the company can change its lay-off procedure, and the right to strike is retained, but the company cannot cancel the agreement.

Vacations will increase at least one day and, in many cases, two days. In lieu of a blanket contract for the Milwaukee, Boston and Pittsburgh plants, which was requested, the contract here will not be signed until the union officials at the two other plants have completed their negotiations.

Allis-Chalmers continues an open shop plant, and men can join or not join the union as they see fit. No hiring agreements were made.

Further Agitation to Limit Exports of Steel Scrap

WASHINGTON — Current reports that Government officials are considering proposed legislation to curb exports of scrap iron and steel through imposition of a quota system were discussed early this week on Capitol Hill but Senator Thomas, Democrat of Utah and chairman of the Senate Military Affairs Sub-committee, which held hearings on proposed scrap licensing legislation two years ago, told THE IRON AGE he knew of no Administration move to push such legislation.

Similarly, Senator Schwollenbach, Democrat of Washington, and sponsor of a bill to license exports of scrap iron and steel, said he was not familiar with the proposal but indicated it might be under consideration. In referring to his bill, S. 651, which

would prohibit exportation of scrap without license issued by the President, the Senator said that he was "up against the position that there is no economic necessity for such a law." Officials at the State Department's Munition Control Board declined comment on the report.

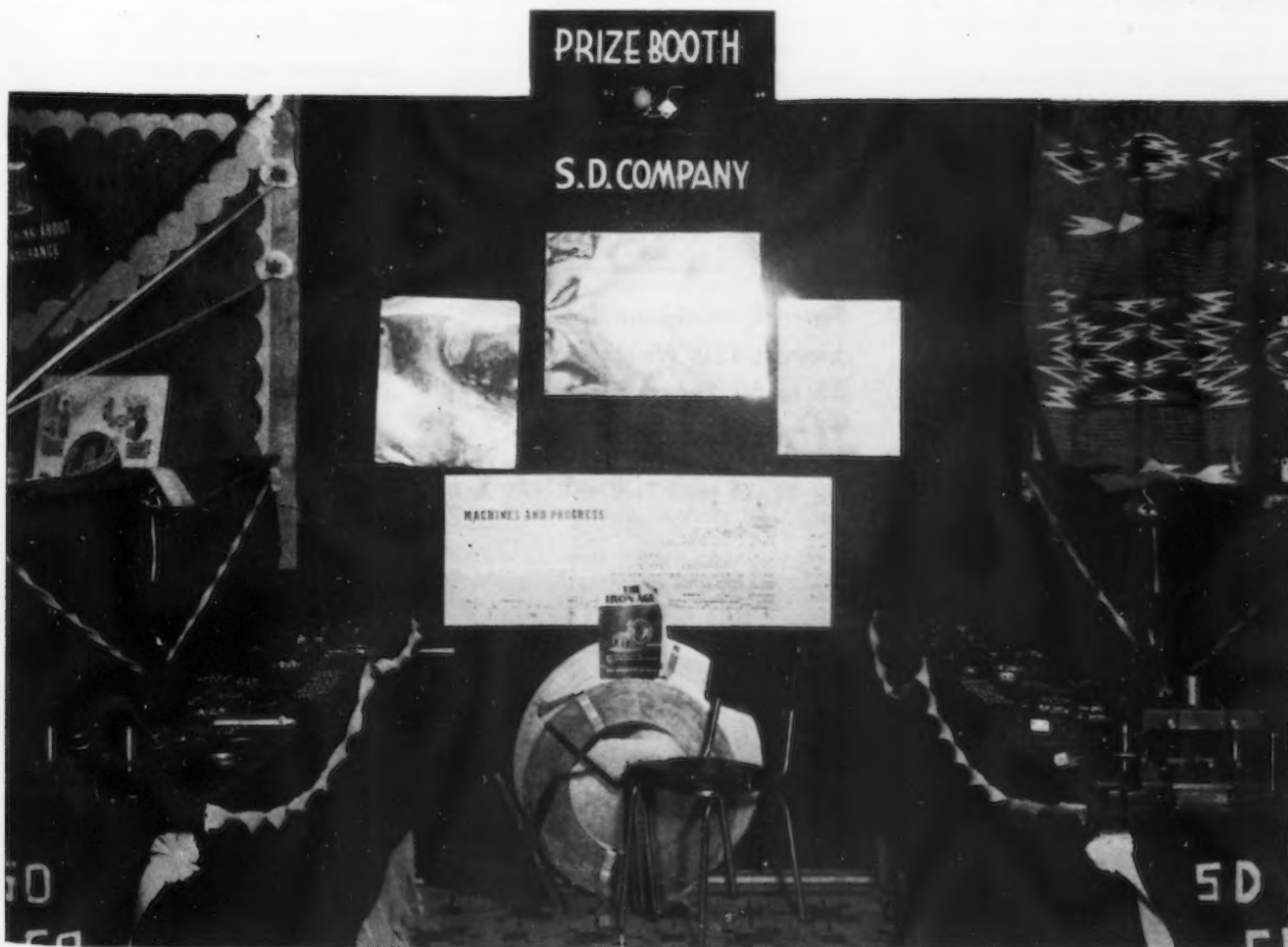
The reported plan, which presumably would be designed primarily to curb exports of scrap to Japan, without mentioning any particular country, by limiting exports to the yearly average of any one country based upon exports over a given number of years, was described by the Senator as not an unlikely step if the current troubles in China take a turn for the worse. But he pointed out that the limitation on exports in such an eventuality would hardly be confined to

scrap iron and steel alone but to all other similar commodities normally shipped to the Far East in quantities.

It was his opinion that public opinion would react immediately if Democratic powers become further involved in China and that Congress would lose little time in passing neutrality legislation under which exports to Japan might be shut off. Under the existing neutrality law, scrap iron could be included with munitions of war at the President's discretion but such a ban on shipment could not be invoked until a state of war was found to exist. Under the proposed amendment to the neutrality law written by Senator Thomas, shipments of munitions to aggressor nations would be prohibited. It was pointed out, too, that in the event a shortage was ever found to exist in the domestic supply of scrap, this commodity could be classified as a strategic and critical material and listed for purchase and the Government would then proceed to build up a stock pile of scrap iron and steel.

THE S. D. Co., Athol, Mass., manufacturer of metal products and hardware items, won a prize for its exhibit at the Parade of Progress Exposition, held in Athol

early in June. The company's exhibit made effective use of the insert titled "Machines and Progress" which was published in the June 8 issue of THE IRON AGE.



A New Deal Agency Learns by Experience

HAMSTRUNG in its operations by ambitious labor union leaders, this time in a strike on the Pacific Coast, the United States Maritime Commission in the past week issued a labor policy statement which closely paralleled announcements made by private employers, such as the United States Steel Corp. Here is how they compare:

MARITIME COMMISSION

"Membership or non-membership in any organization, union or otherwise, cannot be a requisite of employment by the Federal Government."

U. S. STEEL CORP.

"The United States Steel Corp. . . . will never require employees to belong to any union in order to gain employment."

U. S. Machinery Exports To Greece Increase

WASHINGTON — Largely because of its exemption from quota restrictions, Germany dominates the Greek machinery market, though American industrial machinery shipments to Greece in 1938 rose to a value of \$365,000 from \$188,000 in 1937 in the face of quota difficulties, according to a report to the Department of Commerce from its Athens office. Of Greece's total machinery imports of \$4,086,000 during the past year, German machinery accounted for more than 78 per cent with textile equipment the outstanding item. Approximately half of the American machinery imported by Greece in 1938 consisted of excavating equipment, with second-hand mill machinery the next to most important item.

The report said the advantage enjoyed by German machinery exporters in the Greek market is indicated by the fact that applications for imports of German equipment are passed immediately, while it is a matter of months before applications for American items are acted on.

During 1938, a total of approximately \$700,000 was allotted for American machinery imported into Greece, about half of which represented industrial machinery. As of Jan. 1, 1939, a separate allotment of \$157,000 was authorized for imports of American industrial machinery, electric motors, and internal combustion engines during the first half of the current year. However, the report points out, in the face of an active and steadily growing demand for American equipment, this allotment is proving inadequate for

current requirements. As a result, import permits are now being issued with a delay of only four months from date of filing an application, which compares with six months during the earlier part of the year.

It would seem safe to predict, the report said, that American industrial machinery exports to Greece in 1939 might easily reach the three-quarter million dollar mark if import permits could be obtained with even reasonable promptitude. This forecast was based on the fact that because of its superior quality and design, American machinery is preferred to German equipment.

Farrel-Birmingham Co. Honors 130 Workers of 25 to 60 Years' Service

THE Farrel-Birmingham Co., Ansonia, Conn., recently gave a banquet to honor 130 men who have been with the company from 25 to 60

years. Edwin Van Riper, who has completed 60 years of service, was presented with a diamond-studded watch charm and also with a gold watch commemorating 50 years of service to take the place of one awarded 10 years ago, which was stolen. A 50-year watch was also presented to James Dunn, while John Walter received a 25-year service pin.

Of the veteran employees of Farrel-Birmingham, 62 have been with the company from 25 to 29 years; 31 from 30 to 34 years; 16 from 35 to 39 years; 18 from 40 to 44 years; six from 45 to 49 years and nine 50 years or longer.

Igor Sikorsky, airplane builder, gave a talk on developments in aviation.

Remington-Rand Closes Syracuse Plant

THE Remington-Rand Co. has announced the consolidation of the manufacture of portable typewriters at Ilion, N. Y., having closed the plant at Syracuse. Employees of the Syracuse plant are being given an opportunity to apply for work at the Ilion plant.

Valley Mould & Iron Co. Resumes Operations

ORDER accumulations during the past two weeks have enabled Valley Mould & Iron Co., at Hubbard, Ohio, to reopen after a short shut-down. Five hundred employees will be benefited.

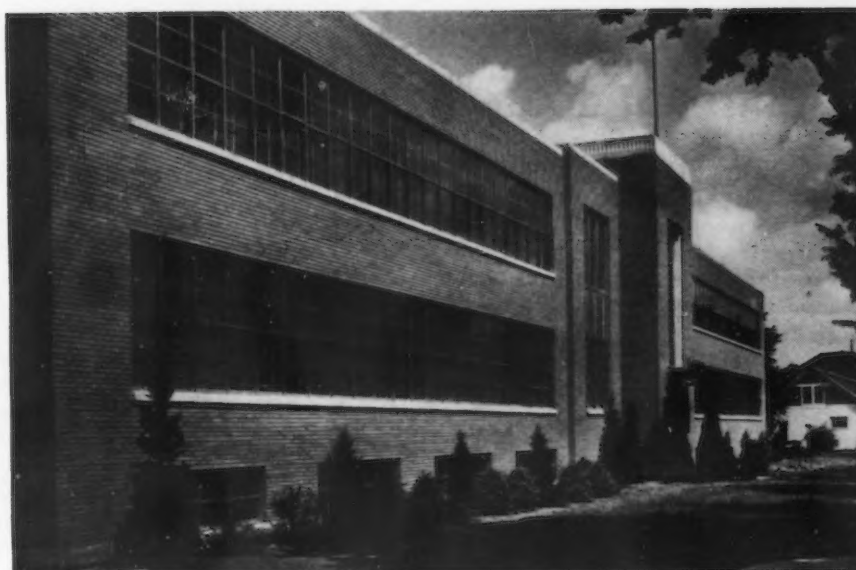
American Locomotive Gets \$419,750 Navy Contract

THE American Locomotive Co., Auburn, N. Y., has been awarded a \$419,750 contract by the Navy Department for surface propelling machinery for a submarine building at the Portsmouth, N. H., Navy yard.



GUESTS at Farrel-Birmingham Service Banquet. Left to right—Franklin Farrel, Jr., chairman of the board; Igor Sikorsky; President N. W. Pickering and Edwin Van Riper, who recently completed 60 years of service with the company.

Monarch Machine Tool Co. To Open New Plant June 24



THIS new factory and air-conditioned office building of the Monarch Machine Tool Company, Sidney, Ohio, will be open to the public for inspection Saturday and Sunday, June 24th and 25th. Completion of the new building climaxes five years of continual expansion during which Monarch's employment has more than doubled.

COMPLETION of its new factory and office building will be celebrated Saturday and Sunday, June 24 and 25, by the Monarch Machine Tool Co., Sidney, Ohio.

The new air-conditioned building will be previewed, following a dinner meeting Friday, by some 400 members of the National Association of Foremen, whose executive officers will be meeting in Sidney. The dinner, to be addressed by Capt. A. A. Nicholson, personnel manager of the Texas Corp., will be held in Monarch's new auditorium, which has been turned over to the National Association of Foremen for their three-day session.

Thousands of people from Sidney and surrounding towns are expected to visit the modern Miami Valley factory which has been expanded steadily for five years during which its employment has more than doubled. Feature of the open house will be an exhibit demonstrating how machine tools make possible the high standard of modern civilization. Some of the country's leading manufacturers in the electrical equipment, transportation, building, telephone, machine tool, petroleum and textile industries have cooperated in building the exhibit for the Monarch opening. There will also be moving pictures and musical entertainment by several groups including the Monarch Employees' Glee Club of 32 voices.

Visitors will be able to see just where everyone, from the office boy to the president of the company, works in the plant. A name card for each of the 570 employees will be placed on the machine, desk or drawing board at which he works.

The company started in 1909 with 25 men in a brick shed.

Fruits of Research

In discussing the new plant, Wendell E. Whipp, Monarch's president,

who is also president of the National Machine Tool Builders Association, says, "Today's new building and increased employment represent the fruits of a program of research and development inaugurated during the darkest days of the depression. When machine tool orders were at their lowest level in a quarter of a century, we concentrated upon improving the design of our lathes, broadening their scope of usefulness in industry and developing more efficient methods of building them, knowing that as business emerged from the depression the need for improved machine tools, and the savings in production costs they make possible, would be greater than ever."

Mr. Whipp was born on a farm near Dayton, Ohio, and attended Ohio State University. He worked for the National Cash Register Co. for seven years in the advertising and sales departments. In 1912 he took over management of Monarch, at that time a struggling, little concern.

Located in a town of scarcely 10,000 people, where today it is the largest single employer, Monarch's present employment is the largest in the company's history. Its latest new building increases the plant area 35 per cent to 135,000 sq. ft. This is almost twice its 1929 size.

In addition to doubling the final assembly department and quadrupling the design and engineering departments, the new building will provide new offices for all management personnel, an auditorium seating 500, a

cafeteria and employees' lounge room, new quarters for apprentice training, a photographic laboratory, a blueprint room and a large display and demonstration room. All except the assembly department are air-conditioned.

Tell Berna Speaks Before Elmira Tool Engineers

TELL BERNA, general manager of the National Machine Tool Builders Association, spoke on "The Tool Engineer and the Machine Tool Industry" before the Elmira, N. Y., chapter of the American Society of Tool Engineers on June 16. The meeting was held in conjunction with the Industrial Management Association of Elmira District, representing 30 industrial plants in that area. Mr. Berna stressed the common interests of the machine tool builders and the tool engineers in industry in producing better and cheaper products.

Another speaker on the program was E. C. Brandt, of Westinghouse Electric & Mfg. Co., who spoke on "Rehabilitation of Industry as an Aid to Relieving Economic Distress." Mr. Brandt pointed out the responsibility of industry to maintain and modernize buildings, machinery and other equipment during periods when production is below normal and explained a budget system whereby money would be set aside during prosperous periods for rehabilitation purposes.

Cold Metal Process Co. Wins Suit Against U. S. Steel on Steckel Mill

THE United States Circuit Court of Appeals at Philadelphia on June 15 upheld the validity of Steckel mill patents Nos. 016 and 195 and declared that these patents had been infringed, while at the same time held that patents Nos. 017, 018 and 056 were invalid because they represented merely engineering skill rather than inventive skill. The decision was rendered in the case of the Cold Metal Process Co. against the Carnegie-Illinois Steel Corp. and the United States Steel Corp. The decision prepared by Judge Buffington represented the unanimous opinion of the court.

The patents were issued to Abram F. Steckel in 1923 for the cold rolling process embodied in the Steckel mill. The patents had been assigned by Mr. Steckel to the Cold Metal Process Co., Youngstown, Ohio, plaintiff in the action. The case went to the Federal Circuit Court on an appeal from an opinion of Judge Guy L. Fake of the Federal District Court of New Jersey, who had upheld the validity of only one of the patents, No. 016.

Unless there is a further appeal to the United States Supreme Court, the question of damages to be paid to the Cold Metal Process Co. will be determined by a special master to be appointed by the Federal District Court of New Jersey, where the litigation originated.

Judge Buffington in his decision said that the court was concerned with the distinction between thin strip and thick steel sheet products and between cold and hot rolling. This distinction, he said, "is strikingly evidenced by the fact that while there were many advances made in heavier steel rolling, there was no advance made in the thin strip art and the method in use when this patent was applied for in 1923 was the same pack method in use for 200 years. . . .

"Without discussing the art in great detail, the fact is that neither by the old pack method, which employed a stand of two rolls to roll heated metal, nor by any known four-roll stand, nor by any continuous roll process, was the art able to make advance in thin strip steel rolling either cold or hot. In that respect we agree with the statement in the patentee's specification that in the divisional application No. 016 cold rolling has theretofore been primarily an expensive finishing

process, and not a cheap reduction process. The art was stagnant."

The Circuit Court of Appeals agreed with the decision of the lower court that the Steckel mill vastly extends the possible width of rolling any gage material and enables it to be made at much higher speeds; that the character of the product is superior; that the conditions under which the men work are vastly improved, and that the cost of production is greatly reduced. It is stated in the decision that among the companies which are operating Steckel mills under license are the Allegheny-Ludlum Steel Corp., the American Steel & Wire Co., Crucible Steel Co. of America, International Nickel Co. and the Weirton Steel Co.

Up to Aug. 31, 1932, the royalties had aggregated over \$132,000, most of the royalties being paid at the rate of 5 per cent of the selling price of the product. It was also stated that the Cold-Metal Process Co. has negotiations pending for more than \$4,500,000 worth of mills, here and abroad.

Further comment of the court was as follows:

"That this great change in the art occurred is an unquestionable fact, and that this change was so radical, novel, useful and original as to call for patent protection was, as noted above, held by one district court; while on the other hand the other district court held it was a mere mechanical forward step to be expected in the ordinary advance of that art.

"Strangely enough, this improvement in the art was not made by one then engaged in steel work, but by an outsider, Abram P. Steckel, who was engaged in other business. He was, however, a trained engineer, having been educated in engineering at Lehigh University, a mechanical training school of high worth.

"The proofs show that seeing the great disparity in product prices between cold rolled wire products and hot and cold rolled sheets, he began considering why such was the case.

"A study of the testimony satisfies us that the solution of this great difference in product cost was due to the fact, without referring to the obstacles, that as the art then existed the peak of cold rolling strip was some two hundred plus feet per minute. As a result of his studies and experiments,

Steckel evolved the process and mechanism embodied in patent 195.

Invention of a High Order

After full consideration, we are of opinion that Steckel's disclosure involved invention of a high order. In the first place it was utterly at variance with the views of the then art and was regarded as foolish. However, on its being put in practice, it attracted the attention of steel men both here and abroad, and led to their coming from this country and Europe and for days studying its workings. It was adopted by steel workers here and abroad and is now being used. Its worth and its novel, useful and inventive character have led to the taking of licenses by numerous great companies and to negotiation for licenses by a larger number of the other large companies. It has in volume of product, in speed of production, in lessened scrap waste, lowering cost of production, in eliminating annealing, in lessening of gage, in cost of labor, fuel, time of production and freeing men from working in torrid heat and "man-killing" work, effected a revolution in cold rolling steel production. All of these and other elements that might be added have been of great service in those other varied great and useful subsidiary industries whose basic element is sheet steel of proper finish and necessarily of exact desired gage. In this vast field of wide use it has been a great contributing effect in aiding these various defendant industries which are bedded on the use of cold rolled steel sheets of required gage and finish. Bearing on the fact, which cannot be gainsaid, of speeding up steel production from one hundred and forty to nine and even twelve hundred feet per minute, and of doing so in days as contrasted with weeks, in avoiding many operations and the three weeks required in the 'pack process, we may refer to *Eibel Co. v. Paper Co.*, 261 U. S. 45, which concerned the strip paper art and which in several details is similar in principle to the present case. There, as here, the old machines could not increase speed because that made ripples in the paper strips. By an adjustment of one of the members of an old combination, the patentee's \$125,000 increased mechanism production was 20 per cent. As contrasted with these figures, Steckel swelled production from about 140 ft. per min. to about 900. Applying the principle there laid down by the Supreme Court, 'Speed which increases production is therefore of the highest importance,' Steckel's patent had for

its avowed purpose the increase of speed. Moreover, large increase of production has always been recognized by the Supreme Court as a basis for patent grant.

"The cold roll mill of Steckel, embodied in patent 195 and the pull or tension rolls of 016 being divisional patents, we find valid and therefore hold the court below erred in holding 195 invalid, but not in error in holding 016 valid. The court below in holding 195 invalid, regarded the use of roller bearings as all important, saying, 'That strikes at the gist of Steckel's patent and moreover the use of roller bearings, whether placed in a two, three or four high rolling mill, amounts to the same thing in the last analysis and nothing more than the skill incident to the art is required to suggest their use in either set . . . What more simple, then, than the installation of roller bearings which would eliminate the friction in the mills and speed up their production.' The court was under the impression that all of real substance that Steckel did was to take the four-stand mill, then in very limited use on the pack rolls, and put roller bearings in such mills. With due respect to the trial judge, we are of the opinion this view did not sense the situation confronting the steel industry. We have seen that there was a great and growing demand for finer gages of steel and for steel of a certain finish. Ball bearings had been in use for 20 years, but no one had shown how they could be used in cold rolling. Their reduction of friction was well known and evidently utilized in many arts. Manufacturers of them advertised their merits and suggested their use in rolling mills and indeed their ability to build a mill using them. But no one, either the advertiser or the steel art, acted on such suggestion. Moreover, what Steckel did was not the mere putting of ball bearings in an existing mill, but was so radical and revolutionary as to necessitate the building of new mills costing immense sums of money.

Licensing Agreement Upheld

In a second decision, handed down the same day, a license agreement between Cold Metal Process Co. and United Engineering & Foundry Co., entered into in 1927, four years after the original patent on the Steckel mill was issued, was held to be true and valid and still operative. The Cold Metal Process endeavored to have the court set aside this exclusive license to produce equipment covered by the Steckel patent No. 1,779,195.

N.A.M. Suggests Numerous Amendments to Wagner Act

WASHINGTON—Representing the Southern Association of Ornamental Iron Manufacturers and other employer interests before the Senate Education and Labor Committee, B. W. Stonebraker, head of the Roanoke Iron Works, Roanoke, Va., protested against what he called irresponsible organizations of labor unions and asked that workers be protected against coercion by organizers. Organizations for which he spoke, he said, favored amendments offered by Senator Burke, Democrat of Nebraska, as "a common sense solution," to labor in employer relations. Mr. Stonebraker said that organizations he represented had declined to permit use of their names because of fear of reprisals by the National Labor Relations Board in cases now pending before it. The charge was made by the witness that conciliators of the Labor Department were being used by labor to coerce employers into signing inequitable contracts. The charge also was made that in one instance a conciliator had "doctored" the record in a case.

Counsel John C. Gall of the National Association of Manufacturers, presenting the first composite picture of burdens on business imposed by inequalities in the Wagner Act, said that the association is "firmly convinced" that the law and its administration "leave much to be desired." He declared that the Labor Board had been "guilting of perverting" the statute. He said that if, as the board claims, it is not infringing the right of free speech, it should not object to a clear provision preserving that right against the possibility of abuse by future boards. Also, he said, if, as the board claims, it has no prejudice against independent unions, it should not object to the amendment by Senator Ellender, Democrat of Louisiana, which "under those circumstances is merely declaratory." If, he continued, the board does not in any way discriminate against men because they have exercised their right to remain unaffiliated with unions there should be no objection to stating the right to join or not to join, as does the Norris-La Guardia Act. Further, he pointed out, if the board is complying with fair rules of procedure, fairly applied, in conducting investigations and hearings and holding elections it should not object to having those rules laid

down for the guidance of all concerned, including the future boards.

"If the board accepts fully the decisions of the Supreme Court in the *Fansteel* and *Columbian* cases, it should, in the interest of labor, prefer to see the rule of those decisions written into the act, so that future boards may not give them an unwarranted interpretation," Mr. Gall pointed out.

In all these respects, he said, the provisions of the amendments proposed by Senators Burke, Walsh and Ellender—which the association is supporting with minor reservations—would be merely declaratory of present law and procedure.

Eleven specific recommendations were made, including:

Rewriting of the preamble; revised definitions of "employees" and "current labor dispute"; protection of employees against unfair labor practices regardless of their source, with reasonable limitations upon the right to strike and withholding of benefits of the act from those engaging in certain types of strikes; definite prohibition as provided by the Railway Labor Act against the closed shop and the check-off; safeguarding of freedom of speech by clear and appropriate language; action by the board on employer positions and elections, such action to be mandatory where the employer is confronted by two or more groups, each claiming to represent a majority of the employees; consideration of elimination of the so-called majority rule provision but if rule is retained other amendments must be made to make it effective and at the same time to protect those who do not wish to affiliate with the majority group; board should not be permitted to make compulsory multiple-unit certifications, combining in one unit the employees of a number of employers; a definite statute of limitations so that employers may not be proceeded against long after the course to which the complaint relates; complaining party before the board should have the burden of sustaining its charges, the board's function being merely that of determining the issues presented by the parties; labor organizations should be required to keep on file with the board, subject to inspection, reasonable information with respect to themselves and to their responsibility.

Current Metal Working Activity

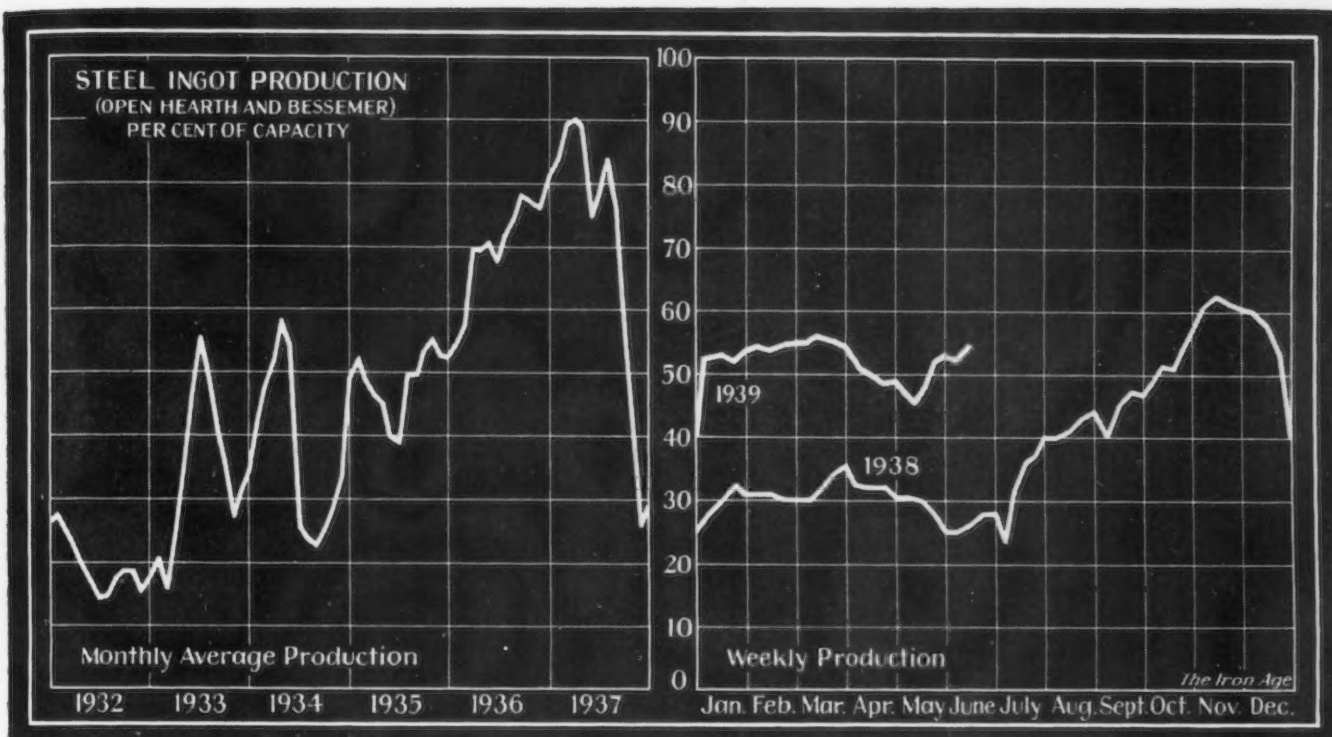
Latest Data Assembled by THE IRON AGE from Recognized Sources

	May 1939	April 1939	March 1939	April 1938	Four Months 1939	Four Months 1938
Steel Ingots: (gross tons)						
Monthly output ^a	2,917,876	2,986,985	3,396,021	1,925,166	12,491,670	7,354,863
Average weekly output ^a	658,663	696,267	766,596	448,757	728,377	428,855
Per cent of capacity ^a	48.24	50.99	56.14	33.44	53.35	31.29
Pig Iron: (gross tons)						
Monthly output ^b	1,717,516	2,056,177	2,394,615	1,376,141	8,686,402	5,555,981
Raw Materials:						
Coke output ^c (net tons)		2,934,560	3,507,237	2,510,964	13,034,807	10,761,095
Lake Ore consumed ^d (gross tons)		2,799,769	3,316,691	1,853,658	11,895,706	7,533,481
Castings: (net tons)						
Malleable, orders ^e		29,183	35,997	19,724	136,519	76,913
Steel, orders ^e		34,100	41,367	21,869	147,851	110,015
Finished Steel: (net tons)						
Trackwork shipments ^a	6,658	6,819	6,481	4,150	20,459	15,121
Fabricated shape orders ^f		116,801	95,065	91,158	396,297	312,879
Fabricated plate orders ^g		35,844	29,784	21,958	109,042	101,259
U. S. Steel Corp. shipments ^h	723,165	701,459	767,910	501,972	2,936,668	2,067,216
Fabricated Products:						
Automobile production ^b		359,200*	371,940	238,129	1,382,927*	906,475
Steel furniture shipments ^a		1,706,642	\$1,886‡	\$1,444‡	7,179,945	\$6,933‡
Steel boiler orders ^g (sq. ft.)		764,996	616,682	474,931	3,329,637	2,150,838
Locomotives ordered ⁱ	51	19	63	3	93	39
Freight cars ordered ⁱ	2,051	2,695	1,000	3	5,702	819
Machine tool index ^j	219.8	155.6	185.4	90.3	91.0†	169.4†
Foundry equipment index ^k		146.0	146.6	79.3	142.8†	94.9†
Non-Ferrous Metals: (net tons, U. S. only)						
Lead shipments ^l		37,903	40,871	25,952	153,384	122,062
Lead stocks ^l		123,394	122,035	156,715
Zinc shipments ^m	39,354	40,641	45,291	20,806	168,399	101,362
Zinc stocks ^m	126,769	130,380	127,985	135,238
Tin deliveries ⁿ (gross tons)	5,905	5,980	4,755	5,980	19,170	18,270
Refined copper deliveries ^o	58,630	46,667	55,025	42,871	216,454	150,434
Refined copper stocks ^o	342,419	332,513	320,812	355,663
Exports: (gross tons)						
Total iron and steel ^p		394,008	474,360	489,249	1,590,730	2,063,016
All rolled and finished steel ^p		134,478	145,164	115,944	134,478	507,706
Semi-finished steel ^p		8,849	9,485	13,355	8,849	114,914
Scrap ^p		237,691	310,223	306,900	996,052	1,253,050
Imports: (gross tons)						
Total iron and steel ^p		44,083	25,369	21,237	116,265	82,284
Pig iron ^p		3,512	3,658	3,823	8,359	17,670
All rolled and finished steel ^p		32,587	14,102	12,475	75,453	52,953
British Production: (gross tons)						
Pig iron ^q	692,100	608,900	603,600	661,000	2,229,000	2,830,000
Steel Ingots ^q	1,218,100	1,058,200	1,170,900	938,000	4,011,900	4,192,800

† Three months' average. ‡ 000 omitted. * Preliminary.

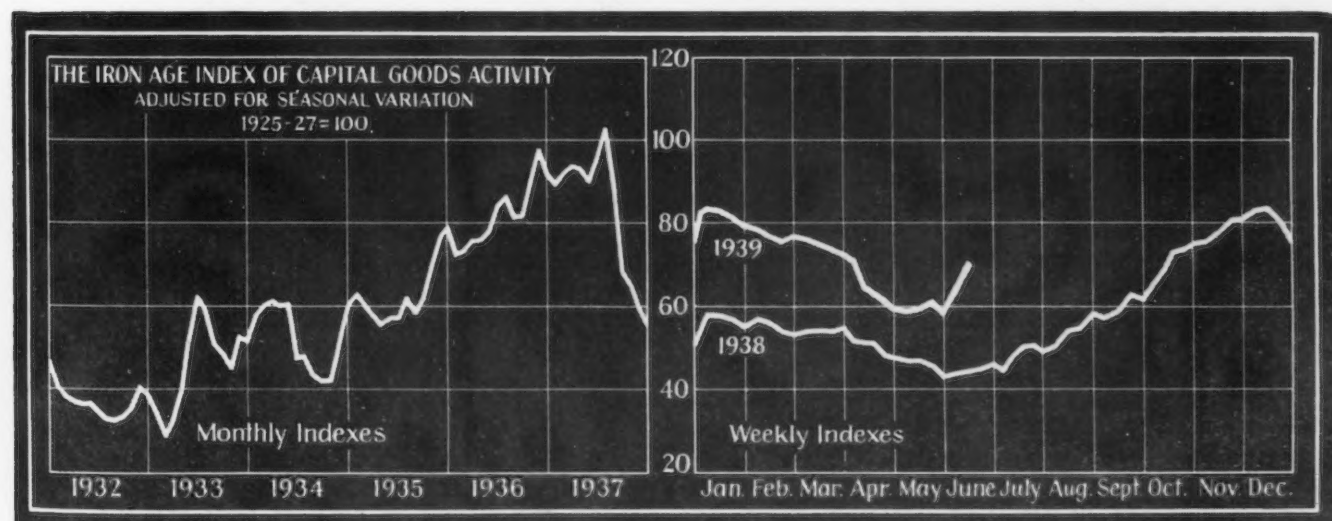
Source of data: ^aAmerican Iron and Steel Institute; ^bTHE IRON AGE; ^cBureau of Mines; ^dLake Superior Iron Ore Association; ^eBureau of the Census; ^fAmerican Institute of Steel Construction; ^gUnited States Steel Corp.; ^hPreliminary figures from Ward's Automotive Reports—Final figures from Bureau of the Census, U. S. and Canada; ⁱRailway Age; ^jNational Machine Tool Builders Association; ^kFoundry Equipment Manufacturers Association; ^lAmerican Bureau of Metal Statistics; ^mAmerican Zinc Institute; ⁿNew York Commodity Exchange; ^oCopper Institute; ^pDepartment of Commerce; ^qBritish Iron and Steel Federation.

Ingot Production Rises Two and One-Half Points to 55%



District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio River	Western	St. Louis	Eastern	Aggregate
CURRENT WEEK..	47.0	49.5	55.0	37.0	53.0	44.5	77.0	55.0	70.0	60.5	54.0	44.0	50.0	55.0
PREVIOUS WEEK..	40.0	49.5	51.0	35.0	53.0	44.5	77.0	55.0	55.5	61.0	54.0	44.0	50.0	52.5

Spurt in Auto Output Pushes Index Higher



A CONSOLIDATION of recent large gains in productive activity was in evidence throughout the capital goods industry in the past week, and, although a few individual sections of the industry showed a slight slackening in activity, operations for the industry as a whole were 4 per cent above the preceding week, according to THE IRON AGE index. At the end of the week the index stood at 68.3, the highest since the seven-day period ended April 8, and 2.8 points above the previous week. The current position of the index is about three points below its position previous to the coal strike. The automobile index was the heaviest contributor to the week's rise, with assemblies gaining 13,040 units to 78,305 in a

contraseasonal movement. The steel output and construction series were also higher in the week.

	Week Ended June 17	Week Ended June 10	Comparable Week	
			1938	1929
Steel ingot production ¹	75.8	73.9	34.6	137.0
Automobile production ²	70.0	57.6	38.1	131.1
Construction contracts ³	75.4	74.7	55.4	118.9
Forest products carloadings ⁴	53.3	54.0	46.6	121.6
Production and shipments, Pittsburgh District ⁵	67.1	67.4	44.3	128.5
Combined index	68.3	65.5*	43.8	127.4

*Revised.

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.

... SUMMARY OF THE WEEK ...

... Ingot rate rises two and a half points to 55 per cent.

° ° °

... Heavy steels account for much of the improvement.

° ° °

... Specifications for flat rolled tonnage coming in slowly.

DESPITE a flattening out in new orders for steel, the rate of ingot production this week has risen two and a half points to 55 per cent, within one point of the highest weekly record this year in the week of March 12.

A considerable part of the improvement occurred in the Pittsburgh and Youngstown districts, with a rise of seven points to 47 per cent in the former and one of four points to 55 per cent in the latter. In the Pittsburgh district a plant that had been idle pending the accumulation of sufficient orders resumed production.

Orders for semi-finished and finished steel in the aggregate compare favorably with those received during the same period in May, but, except in heavy steels for construction work and in flat rolled products being taken out against recent commitments, the volume is showing no appreciable gains. Unless sheet and strip specifications come in more rapidly, the present rate of ingot production may not be maintained during the next few weeks, although the prospect still appears to be good for a further step-up several weeks hence when automobile manufacturers are ordering more heavily for 1940 model production.

ONE of the most significant developments of the week is the apparent determination of some branches of the steel trade to adopt a firmer position on prices. This is particularly noticeable in the wire trade, where published quotations on nails and fence, which have been weak items, are to be rigidly adhered to, it is stated. Bar manufacturers have also signified their intention to make no change in their recent announcement which abolished quantity deductions and decreased the base price \$2 a ton, although large buyers, who after July 1 must pay \$1 more a ton for quantity lots, had brought considerable pressure for a concession that would give them the same net price as before. Now that

every important buyer of sheets and strip has been given the full benefit of the recent \$8 a ton concession, the flat rolled steel market is expected to remain on a stabilized basis, although present published prices will have little meaning for some time to come, as they are \$5 a ton above the shipping prices that will be in effect on booked tonnage. One of the weakest items in the entire list is plates, on which concessions of \$2 or \$3 a ton have become more common.

PENDING the further clarification of the outlook for steel production during the summer months, the advance in scrap prices has halted. In fact, the average quotation at Chicago is slightly lower, resulting in a decline of 4c. a ton in THE IRON AGE scrap composite price to \$14.75. Basically, the scrap situation is strong, but additional mill purchasing will be required to give prices a further boost. Strength at seaboard points has been derived from a fresh purchase of over 100,000 tons by the European scrap cartel, which brings the total of its orders placed in this country in the past two months to more than 500,000 tons. Prices paid were approximately the same as on other recent purchases. Renewed agitation in Washington for a limitation on scrap exports has not yet reached the point of introduction of legislation, and there are doubts there that any action will affect scrap unless other strategic materials are also included.

THE steel industry and the lines of activity upon which it largely depends have recovered most of the ground lost during April and May. THE IRON AGE capital goods index has risen 2.8 points this week to 68.3, highest since the week ended April 8, and this rise has been largely due to increases in automobile assemblies, building construction and steel output.

Fabricated structural steel awards this week total 23,300 tons, of which 12,000 tons is for a Potomac River bridge at Ludlow Ferry, Md. While new structural projects total only 15,700 tons, the appearance of some private jobs is a welcome sign. Reinforcing steel awards are 8000 tons, on top of which are new projects totaling nearly 12,000 tons.

Railroad buying is showing no signs of important pickup. Some of the farm machinery plants are shut down for two or three weeks for vacations and inventory taking. Tin plate production is holding steady at 70 per cent. All in all, the industrial picture is spotty, but there are indications of moderate improvement over the last half of the year.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
Rails, heavy, at mill	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.15	2.15	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	*2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.65	2.65	2.65	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.70	2.70	2.70	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.00	2.00	2.00	2.30
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.80	2.80	3.10
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.65
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.00	2.00	2.00	2.30
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.05	3.05	3.35

*Subject to concessions in some districts.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	†3.30	3.30	3.30	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	\$5.00	\$5.00	\$5.00	†\$5.35

*Pittsburgh prices only.

†Applies to 80-rod spools only.

‡Subject to post-season adjustment.

Pig Iron

Per Gross Ton:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
No. 2 fdy., Philadelphia	\$22.84	\$22.84	\$22.84	\$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti.	21.06	21.06	21.06	23.89
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.34
Ferromanganese, seab'd carlots	80.00	80.00	80.00	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
Heavy melting steel, P'gh.	\$15.25	\$15.25	\$14.25	\$11.50
Heavy melting steel, Phila.	15.50	15.50	15.25	12.25
Heavy melting steel, Ch'go.	13.50	13.625	12.75	10.25
Carwheels, Chicago	12.75	12.75	12.50	12.00
Carwheels, Philadelphia	16.00	16.00	16.00	14.75
No. 1 cast, Pittsburgh	15.25	15.25	15.25	13.25
No. 1 cast, Philadelphia	16.25	16.25	16.25	14.25
No. 1 cast, Ch'go (net ton)	12.25	12.25	11.75	10.25

Coke, Connellsville

Per Net Ton at Oven:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
Furnace coke, prompt	\$3.75	\$3.75	\$3.75	\$3.75
Foundry coke, prompt	4.75	4.75	4.75	4.75

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	June 20, 1939	June 13, 1939	May 23, 1939	June 21, *1938
Copper, electrolytic, Conn.	10.00	10.00	10.00	9.00
Copper, lake, New York	10.00	10.00	10.00	9.125
Tin (Straits), New York	49.125	48.25	48.70	42.25
Zinc, East St. Louis	4.50	4.50	4.50	4.00
Zinc, New York	4.89	4.89	4.89	4.39
Lead, St. Louis	4.70	4.60	4.60	3.85
Lead, New York	4.85	4.75	4.75	4.00
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	14.00

The Iron Age Composite Prices

Finished Steel

June 20, 1939	2.236c. a Lb.
One week ago	2.236
One month ago	2.236
One year ago	2.487

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

High	Low
1939..... 2.286c., Jan. 3;	2.236c., May 16
1938..... 2.512c., May 17;	2.211c., Oct. 18
1937..... 2.512c., Mar. 9;	2.249c., Jan. 4
1936..... 2.249c., Dec. 28;	2.016c., Mar. 10
1935..... 2.062c., Oct. 1;	2.056c., Jan. 8
1934..... 2.118c., Apr. 24;	1.945c., Jan. 2
1933..... 1.953c., Oct. 3;	1.792c., May 2
1932..... 1.915c., Sept. 6;	1.870c., Mar. 15
1931..... 1.981c., Jan. 13;	1.883c., Dec. 29
1930..... 2.192c., Jan. 7;	1.962c., Dec. 9
1929..... 2.223c., Apr. 2;	2.192c., Oct. 29
1928..... 2.192c., Dec. 11;	2.142c., July 10

Pig Iron

\$20.61 a Gross Ton
20.61
23.25

Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

High	Low
\$23.25, June 21;	\$19.61, July 6
23.25, Mar. 9;	20.25, Feb. 16
19.73, Nov. 24;	18.73, Aug. 11
18.84, Nov. 5;	17.83, May 14
17.90, May 1;	16.90, Jan. 27
16.90, Dec. 5;	13.56, Jan. 3
14.81, Jan. 5;	13.56, Dec. 6
15.90, Jan. 6;	14.79, Dec. 15
18.21, Jan. 7;	15.90, Dec. 16
18.71, May 14;	18.21, Dec. 17
18.59, Nov. 27;	17.04, July 24

Steel Scrap

\$14.75 a Gross Ton
14.79
14.08
11.33

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

High	Low
\$15.29, Mar. 28;	\$14.08, May 16
15.00, Nov. 22;	11.00, June 7
21.92, Mar. 30;	12.92, Nov. 10
17.75, Dec. 21;	12.67, June 9
13.42, Dec. 10;	10.33, Apr. 29
13.00, Mar. 13;	9.50, Sept. 25
12.25, Aug. 8;	6.75, Jan. 3
8.50, Jan. 12;	6.43, July 5
11.33, Jan. 6;	8.50, Dec. 29
15.00, Feb. 18;	11.25, Dec. 9
17.58, Jan. 29;	14.08, Dec. 3
16.50, Dec. 31;	13.08, July 9

... THIS WEEK'S MARKET NEWS ...

PRICES

... Mills seem determined to firm up prices wherever possible

A DEVELOPMENT in the price situation this week is the apparent determination of steel mills to create a firmer market wherever possible. This was apparent for example among wire producers, who have declared strict adherence to published quotations on nails and fence, which have been weak items. Merchant bar producers declare their intention to abide by the recent announcement whereby quantity discounts were abolished and the base price reduced \$2 a ton, thereby adding \$1 a ton to the net cost for large buyers. Owing to the pressure brought by large buyers, there had been a belief in the trade that some measure might be taken by the mills so that bars would cost large buyers no more than before. The mills have become convinced, however, that only by presenting a stronger front against price attacks can be price structure be strengthened.

One of the weakest spots in the market is plates, on which concessions of \$2 or \$3 a ton have become fairly common on some districts, particularly on the lighter gages which come close to heavy sheet gages.

During the past week the recent \$8 a ton concessions on flat rolled products were extended so that every buyer of importance has been protected at this low level for the third quarter at least.

STEEL OPERATIONS

... Ingot rate at 55%, up two and a half points over last week

INGOT production for the current week is estimated at 55 per cent, a gain of two and a half points over last week, but this rate may not hold during the next few weeks unless specifications for sheets and strip against recent commitments come in more rapidly than they have been.

The sharpest gain this week is in the PITTSBURGH district, where a rise of seven points to 47 per cent is partly the result of resumption of operations by a plant that had been shut down to accumulate orders.

There has also been a gain of four points to 55 per cent in YOUNGSTOWN and nearby cities. Otherwise there have been only minor fluctuations.

Although only 15 out of 26 open hearths in the BIRMINGHAM district are in operation, the rate of production there is being boosted by the use of open hearths for hot metal, resulting in an average of 70 per cent for that district.

NEW BUSINESS

... Total tonnage about equal to that of same period in May

HEAVY steel demand including plates, structural shapes and reinforcing bars, was in the forefront at PITTSBURGH, last week. Although sheet specifications against low-priced commitments represent a volume from the tonnage standpoint much greater than before the price war, an actual decline in shipping releases occurred during the past week. There is increasing evidence that sheet and strip customers are in no hurry to place specifications or orders against initial commitments.

The seasonal downtrend has been less drastic than expected at CLEVELAND and YOUNGSTOWN. Incoming orders of steel mills are well maintained, indicative of fair but sometimes sporadic activity on the part of diversified consumers. Practically all orders and releases are desired for immediate use. Nevertheless, several weeks of gradually slackening demand would not be surprising, followed by a pickup as the automotive industry swings into production of its new models in late July or early August.

With some of the major agricultural machinery plants shut down the remainder of this month for vacations and inventories, demands at CHICAGO from this industry has lessened considerably. Releases from automobile makers and suppliers are looked for next month and are expected to be fairly regular through July and August. Sheet and strip releases so far this month are about the same as in May. Bookings of new business in all lines are about even with the same period in May, excepting sheet and strip orders last month. Steel buying for the Milwaukee cars is about completed and the railroad picture again

is dark. Only the Illinois Central and Northwestern have major car building proposals pending. CHICAGO rail mills have some business yet to be rolled but next month may see the end of current bookings.

New business in the PHILADELPHIA area is holding to recent levels, if the heavy sheet and strip bookings of the past month are excluded. The demand for standard pipe is not up to seasonal expectations, while the call for wire and tubular products is very poor. Tinplate demands are exceeding most estimates. This item, and structural and reinforcing bar business, accounts for most of the current sales in that district.

In NEW YORK sales totals so far this month are about even with those for the same period last month, but in the past week there has been a decline as compared with the one or two weeks previous.

PIG IRON

*... Sales are light in most districts
... Shipments not gaining*

DULLNESS pervades pig iron markets in all districts. In such important centers as PITTSBURGH, CLEVELAND and CHICAGO there has been little change in the past month. In general, foundries are hesitant in ordering for the third quarter. One exception noted at CLEVELAND is the foundry trade that caters to the oil industry, which seems to be slightly more active than a few months ago. One reason for this may be expansion in South American oil fields.

At ST. LOUIS there has been no buying for several weeks except material required for immediate consumption. Buyers there, it is reported, appear to be influenced by the possibility of lower prices.

Little third quarter iron has been contracted for in the NEW YORK district and spot business is running light. There appears to be a let-up in foundry activity in western New England points, but farther east both machine tool builders and textile machinery manufacturers are approaching capacity operations. However, taking the New England melt collectively, it is probably less than it was a month ago. One of the brightest spots in New England is the Warren Foundry &

Pipe Corp. at Everett, Mass., which is running five days a week, with sufficient business on its books to insure current activity for many weeks.

Some foundries in the East will shut down for the entire Fourth of July week.

Production of iron in the BIRMINGHAM district has been increased with the blowing in of a Republic Steel Corp. stack. Republic now has all three of its furnaces in blast. The BIRMINGHAM total of active stacks is now 14.

IRON ORE

... Consumption running well ahead of last year

CONSUMPTION of Lake Superior iron during May was 2,245,513 gross tons against 2,799,769 tons in April and 1,711,146 tons in May, 1938, according to the Lake Superior Iron Ore Association, CLEVELAND. For the current year up to June 1, consumption totaled 14,141,219 tons, which is around 5,000,000 tons ahead of the corresponding part of 1938 at 9,194,627 tons.

Ore on hand at furnaces and Lake Erie docks totaled 23,071,214 tons on June 1 against 22,790,933 tons on May 1 and 33,011,974 tons on June 1, 1938. On May 31 there were 82 furnaces depending principally on Lake Superior iron ore in blast against 80 one month earlier and 60 on May 31, 1938.

The Great Lakes ore fleet consisted of 195 vessels on June 15 out of 303 available, according to the report of C. C. Lindeman of the M. A. Hanna Co., Cleveland. This compares with 170 active on May 25 and 116 in service June 15, 1938.

MERCHANT BARS

... No change to be made in present published price

SOME bar producers have clarified the hot rolled bar price situation with respect to large buyers by confirming the effectiveness of the present published price of 2.5c. a lb. f.o.b. PITTSBURGH. Sales offices have been notified that customers who purchase 75 tons or more of one size and grade can do so up to the end of this month under the setup which existed previous to the elimination of the quantity discount. The net price under such conditions is \$1 a ton lower than the present published price which actually goes into effect July 1. It is understood

that bar business placed under the old setup during the remainder of this month must clear the mills by July 31. A minor change has been made by alloy bar producers whereby quantities of 2000 lb. and under will take the warehouse price. Formerly 1000 lb. represented the minimum. The base price has not been altered.

Hot rolled bar sales at PITTSBURGH so far this month have been running somewhat ahead of a month ago and in some instances the increase in volume has ranged from 20 to 30 per cent. Total tonnage, however, is not necessarily large as bar sales have not expanded during the past few months. Improvement in tonnages has also been registered during the past week with diversification fairly general.

Orders at CLEVELAND so far this month are running slightly ahead of those received in the same period of May. Shipments show greater improvement.

CHICAGO district interest in bars has slackened considerably in the past month or so. Farm equipment and tractor buying has diminished in the past two weeks, the latter for a time having been the main support of this market. Cold drawers and forgers are only moderately occupied, but are hoping for increased activity when the automobile industry begins in earnest on 1940 models.

SEMI-FINISHED STEEL

... Specifications steady ... Expansion expected later on

SPECIFICATIONS at PITTSBURGH so far this month have been in about the same volume as in the corresponding period a month ago. During the past week, however, bookings have leveled off slightly but the decline is not considered significant. Movement of sheet bars in the future will be closely aligned to the speed with which flat-rolled steel customers send in shipping releases against commitments to non-integrated mills. Support from forge shops is not anticipated much before the next few months when automobile companies will be considerably more active.

New business in the CLEVELAND district has diminished recently but shipments so far this month show a gain over the same period of time in May.

There is a fairly active demand for forging billets in EASTERN PENNSYLVANIA, traceable almost entirely to shipyard work.

PLATES

... Price situation weak in the East ... Cuts of \$2 to \$3 a ton

THE price situation on plates is becoming definitely more disturbing to producers. While the East appears to be the weakest spot, concessions have appeared in other areas. Concessions of \$2 or \$3 a ton have become more common, particularly in the lighter gages which come close to the heavy sheet gages. Originally the weakness in plate prices appeared to spring from abuses of the fabrication-in-transit privilege, but lately outright concessions have been granted where no f.i.t. is involved.

Plate specifications at PITTSBURGH so far this month are about in the same volume as those placed during the same number of days in May but new business in the past week reflects a moderate increase as the result of recently awarded structural steel projects.

At CLEVELAND up to June 20 incoming orders were comparable to those of the corresponding part of May, but outstanding tonnages were infrequent. Cleveland sellers report improvement in the price situation on plates.

Little important demand for plates is noticeable in the CHICAGO area at present. Prices are weak because of the bad situation in sheets. The Northwestern's petition to buy 800 cars has been extended by the court, so action on this project has been delayed once more.

Miscellaneous plate buying in the NEW YORK area continues at the low level that has prevailed in recent months. An inquiry for 4000 tons of ship plates and shapes for Denmark is still current. Meanwhile, the export market has firmed up slightly, the present quotation being \$1.67 per 100 lb. f.a.s., in place of the low of \$1.65.

The Los Angeles Department of Water and Power will include a steel pipe alternate in its specifications for the Grant Lake conduit, Mono County, Cal., on which bids will be asked shortly. Bids call for Shasta Dam, Cal., penstocks, totaling about 5000 tons, is expected within the next 60 days.

Socony-Vacuum Oil Co. has awarded a contract for a bulk plant requiring 105 tons of plates for tanks inside the building, but will erect these additional storage tanks: six 20,000 gal., three 230,000 gal. and one 840,000 gal.

STRUCTURAL STEEL

... Mill specifications gaining as a result of recent awards

STRUCTURAL shape specifications at PITTSBURGH so far this month are roughly estimated at 20 per cent above the corresponding number of days in May, while the past week's performance discloses a moderate increase in volume from the previous week. This mild step-up in structural specifications is a reflection of the increase in structural awards placed during the past few months. Although publicly financed projects continue to outnumber private jobs, the latter have increased in number in the past month.

The largest award of the week was 12,000 tons for a Potomac River bridge at Ludlow Ferry, Md., which went to the Harris Structural Steel Co. The R. C. Mahon Co., Detroit, will furnish 1660 tons for a bridge in Cleveland.

The National Gypsum Co., New York, will require 1200 tons for a plant addition. Other sizable inquiries are in bridge construction, one of 1800 tons for a bridge at YOUNGSTOWN and one of 1600 tons for a bridge in CLEVELAND.

REINFORCING BARS

... Market fairly active ... Mill specifications gain

CONCRETE bar specifications continue to increase and producers are looking forward to a substantial volume of business over the next few months.

Bethlehem Steel Co. is furnishing 1400 tons of concrete reinforcing bars for a Kittatinny-Blue Mountain tunnel, a section of the Pennsylvania Turnpike, in Franklin County, Pa. Jones & Laughlin Steel Corp. will furnish close to 500 tons of bars on the same project for the Rays Hill tunnel, Franklin County, Pa.

No awards were announced this week in CHICAGO but a number of jobs are awaiting final signatures and will be listed within a short time. Another section of the CHICAGO subway calls for 3350 tons. CHICAGO fabricators and estimating offices are well occupied with work and prospects are good for the continuation of this condition throughout the summer. The only unfavorable factor in the situation is the status of prices which in spite of improved volume, do not seem to have strengthened appreciably.

For the SEATTLE courthouse approximately 1700 tons was awarded to Bethlehem Steel Co., SEATTLE, to be rolled there. Columbia Steel Co., SAN FRANCISCO was awarded about 500 tons, the bulk for Kamehameha School, Honolulu, T. H., and the balance for a local Treasury Department job. New bar projects on the Pacific Coast total about 1000 tons, the largest being a 371-ton underpass at Santa Monica, Cal.

Largely because of Connecticut River flood control work, the New England market for reinforcing steel has taken a new lease of life, and with Government flood control projects in the making in New Hampshire, western Massachusetts and Connecticut in the form of dams, may continue active for some weeks. New projects the past week approximated 4000 tons, bringing the total of figured and uncovered projects up to better than 9000 tons. The largest new job is 1000 tons for a Procter & Gamble Co. plant at Quincy, Mass.

In the NEW YORK area, pending projects are featured by a second batch of New York State highway projects involving close to 1500 tons of bars and mesh. Prices are very soft in NEW YORK and PHILADELPHIA.

The office of the General Purchasing Officer of the Panama Canal, Washington, will open bids on June 29 for 1023 tons of concrete-reinforcement billet bars and 187 tons of structural steel, plates, bars and round rods for delivery to either Cristobal or Balboa, Canal Zone.

SHEETS AND STRIP

... Specifications coming in slowly against recent commitments

ON the whole, sheet specifications at PITTSBURGH during the past week, most of which are against recent commitments, were not up to the level of the previous week. Some producers are encountering difficulty driving specifications in. Business which is being received is widely diversified as support from the automotive industry is not expected much before the latter part of July or the early part of August. Sheet sales offices are slowly resuming normalcy following the avalanche of paper work occasioned by the recent sheet and strip price situation.

At CLEVELAND and YOUNGSTOWN also releases against blanket sheet and strip tonnages have been slow to materialize. Probably three or four weeks

will elapse before improvement in this respect is noted.

Specifications on the recent low priced tonnages are coming through in fair volume in the NEW YORK district, and some consumers, notably refrigerator manufacturers, are pressing for delivery, indicating that consumption is above earlier estimates. Export demand for galvanized sheets has jumped in recent weeks to almost double the volume of the previous three months, some sellers report.

COLD FINISHED BARS

... Business in slightly better volume than month ago

MOSTLY of a miscellaneous nature, cold finished bar business so far this month is in slightly better volume than a month ago. Some fill-in business has emanated from the automobile industry but representative tonnages from motor makers are not expected to be placed much before next month.

RAILROAD BUYING

... Orders and inquiries for equipment are small

ERIE RAILROAD is inquiring for six 70-ton auxiliary water tank cars, each with 16,000-gal. capacity.

Atlas Car & Mfg. Co., Cleveland, has been awarded three 50-ton diesel electric switching engines for the Mare Island, Philadelphia and Norfolk navy yards and one 350-ton engine for Raritan Arsenal of the army.

The Denver & Rio Grand Western has applied to the Interstate Commerce Commission for authority to issue \$1,545,000 in equipment trust certificates to finance the purchase of 550 all-steel cars from the Pressed Steel Car Co., Pittsburgh. The equipment will consist of 400 box cars of 50-ton capacity; 100 automobile cars of 50 tons; and 50 gondolas of 70 tons. The total cost will be \$1,724,219, the difference between this sum and the amount of the certificate issue to be paid in cash.

The Burlington Lines have purchased approximately 4000 tons of rails from Carnegie-Illinois Steel Corp.

Class I railroads in the first five months of 1939 put in service 7111 new freight cars, the Association of American Railroads has announced. In the same period last year Class I

railroads put 5786 in service. New steam locomotives put in service in the first five months of 1939 totaled 12 compared with 105 in the same period of 1938. New electric and Diesel locomotives installed in the five months period this year totaled 84, compared with 55 in the same period last year.

Recent equipment purchases include 125 box cars and 25 gondolas for the Missouri-Illinois, placed with Mt. Vernon Car Mfg. Co.

H. C. Frick Coke Co. is taking bids on three electric locomotives. Purchases contemplated, but on which formal inquiries have not yet been issued, include 30 hopper cars for the Tennessee Valley Authority and six diesel-electric locomotives for the Boston & Maine. The Milwaukee Road has received court authorization to build 83 box cars and remodel 200 automobile cars in its own shops.

BOLTS, NUTS AND RIVETS

... Volume is holding up fairly well

PRODUCERS of bolts, nuts, rivets and cap screws are very much encouraged that volume has held up recently instead of dwindling away entirely. Diversified demand, rather than any particular class of trade, seems responsible for the cushioning. Price policies for third quarter are being weighed but early this week no general announcements had been received.

TUBULAR GOODS

... Movement of merchant pipe has expanded moderately

TOTAL tubular good sales at PITTSBURGH, except for merchant pipe demand, are virtually unchanged from the levels which have existed for at least the last three months. Oil-

country goods specifications have been showing little trend either upward or downward and no change in this situation is expected in the near future. Movement of merchant pipe, however, has expanded moderately in keeping with the increase in building activity.

WIRE PRODUCTS

... Firming up of prices on merchant items noted

BOTH merchant wire products and manufacturers' wire sales at PITTSBURGH so far this month have been substantially below bookings placed during the same period in May. Of the two divisions, merchant products have suffered the most, but producers look for a better volume of incoming business within the next month or so. Mid-year inventory influences have been responsible in part for the poor showing this month. Some concessions amounting to \$2 a ton on wire nail prices to jobbers have been withdrawn this week. It is understood that the tonnage involved prior to the withdrawal was not substantial.

CLEVELAND sellers of merchant bar products report a less drastic seasonal downtrend than usual. Nevertheless, that market is definitely more quiet. Manufacturers' wire and rods continue at about the same order levels as in other recent weeks.

Biggest news of the week at CLEVELAND is the strengthening in merchant wire products prices. Producers express the intention of adhering strictly to published quotations, thus increasing their net return. Realization from wire nails, as reported last week, has been improved \$2 to 3 per ton recently.

Merchant products demand from the farm country around CHICAGO is well maintained. Chief interest is in bale ties and fence. Electrical wire and reinforcing mesh are fairly active, reflecting the busy period of the con-

struction industry. Oil and gas field buying is not what it might be but manufacturers' wire production should increase with progress in 1940 motor cars.

TIN PLATE

... Operations steady at about 70% ... Releases fair

TIN plate operations remain unchanged this week at approximately 70 per cent. Shipping releases have been coming in at a rate sufficient to support this relatively high operating rate. Little or no change in the volume of specifications and operations is expected during the next few weeks.

TRADE NOTES

Ransome Concrete Machinery Co., Dunellen, N. J., manufacturer of electric welding or chucking tables, has appointed the following new representatives for the welding equipment division only: Cheever Equipment, 1962 First Avenue, South, Seattle, Wash., covers Alaska, Washington and part of Idaho; Victor Equipment Co., 844 Folsom Street, San Francisco, and 3821 Santa Fe Avenue, Los Angeles, in California, and Austin-Hastings Co., Inc., 226 Binney Street, Cambridge, Mass., in New England.

Michigan Hydraulic Steel Co., 10600 Southern Avenue, Dearborn, Mich., announces establishment at that address of a new scrap yard equipped with a modern hydraulic compressing machine. Frank Tuschman is general manager.

Cliffs Corp., Cleveland, at a special meeting recently voted to change common stock from no-par to a par value of \$5 per share. This reduced the stated capital from slightly over \$24,000,000 to slightly over \$4,000,000, and will result in transfer to capital surplus of the difference between these two sums, or about \$20,000,000.

Blaw-Knox Co. has completed a manufacturing and selling arrangement with Societe Anonyme Ateliers De Tombay, a fabricating company in Belgium, to produce certain Blaw-Knox products. This arrangement is for the purpose of supplementing the effort of the company's English and French facilities.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	June 20, 1939	June 13, 1939	May 23, 1938	June 21, 1938	1939	1938
Fabricated structural steel awards	23,300	17,500	12,850	8,800	500,375	328,750
Fabricated plate awards	1,275	14,580	2,020	6,500	90,850	69,000
Steel sheet piling awards	4,050	3,325	0	0	30,955	14,150
Reinforcing bar awards	8,000	7,000	10,400	7,125	229,995	110,270
Total Letting of Construction Steel ..	36,625	42,405	25,270	22,425	852,175	522,170

IRON AND STEEL SCRAP

... New buying is absent, but strength still exists ... Weakness at Chicago reduces composite 4c. to \$14.75.

JUNE 20—There have been few price changes in any market in the past week. New buying is in small lots, yet strength is noted in most districts. Only at Chicago has weakness appeared and on the basis of small sales the average is down there 12½c. from last week for No. 1 heavy melting steel. Flow of material, particularly No. 2 steel, from Pittsburgh to the Valley is largely responsible for the continued strength at the former point where local sales continue light. Philadelphia prices are being supported by strong export demand and increased domestic buying. With the change at Chicago, the composite price drops 4c. to \$14.75.

New orders from the European cartel are reported, bringing the total of recent sales above 500,000 tons. A good part of the current commitment is for Great Britain and will be shipped from the Gulf and also Atlantic ports. Railroad steel commanded a slightly lower price, but other grades were unchanged from the prices that have prevailed for the last six months or more.

Pittsburgh

Despite little or no consumer buying in the past few days, the scrap market continues strong. The unusual condition whereby scrap, especially No. 2 heavy melting, is moving from the Pittsburgh district into the Youngstown area, continues. Pittsburgh brokers are paying from \$14.75 to \$15.25 for No. 1 in covering recent transactions. This district will remain affected by old and new export purchases, as well as the greater tempo in activity in the Valley.

Chicago

Brokers being able to purchase heavy melting steel in small lots for \$13.25, this grade is now quoted at from \$13.25 to \$13.75 as compared with \$13.50 to \$13.75 last week. It appears now that most mills are well supplied with scrap for the near future and dealers are not optimistic for another sale any time soon. The Chicago & Eastern Illinois sold a small list last week and the Rock Island is offering some old material this week.

Philadelphia

The market here continues to display a strong undertone in face of unabated export demand and intensified domestic interest in steel making grades. Additional commitments by the European cartel in the past week, together with the growing tightness in steel making scrap is responsible for the optimism evidenced by sellers here. No. 2 supplies are particularly tight, most of the recent domestic sales having involved this grade. Moder-

ate tonnages of both No. 1 and No. 2 steel were purchased in the past week at \$15.50 and \$13.50 respectively. Recent activity in machine shop turnings justifies an increase in quotations on this grade of 50c. to \$8.50 to \$9. Export buying prices remain unchanged.

Cleveland

The market here remains in a good position with prices steady and good material still not over abundant, although better automotive production has assisted in building up potential available supplies.

Youngstown

Scrap is more plentiful and mills which two weeks ago reported difficulty arranging shipments are now being served more adequately. The loosening up process so far has not weakened published quotations. Open-hearth operations are highest in some time.

Buffalo

The scrap market remains quiet this week with no sales reported. Shipments are still suspended at one mill and restricted at another. In the absence of activity prices are holding their own. Dealer sentiment does not indicate the probability of heavy buying right away. Cast scrap is slow.

St. Louis

The market for scrap iron and steel remains extremely dull. Sales are confined to a few scattered lots of the various grades for prompt delivery. Mills are out of the market, several having ample supply to support present rate of operations for several weeks to come. Offerings from all sources are light. Small dealers are unwilling to sell at present prices. Railroad lists: Chicago & Eastern Illinois, 1000 tons; Southern Railway, 5896 tons; Rock Island, 3586 tons.

Cincinnati

The old materials market in southern Ohio tapered with the close of the past week, but the underlying strength is still supporting prices which were advanced 50c. last week. The top prices on some items, during the past week, ran in advance of the market as a result of dealer anticipation of more aggressive purchasing, but with mills failing to match dealer optimism with substantial ordering at greatly improved prices, the market leveled off at about the same position as was maintained last week.

Detroit

Sentiment in Detroit has become more mixed in the last 10 days with the gap between bulls and bears widening perceptibly during that period. Optimism on a somewhat increased scale is attributed to improved automotive schedules, prolonged 1939 model seasons, moderate buying of isolated items by the principal scrap consumer in this area and higher prices bid on recent lists. Contrary indications are found in the reported fact

that certain nearby mills will be out of the scrap market for two to three months and that buying, no matter what the automotive schedules may be, will continue to be light. Rumors of a reciprocal purchase of a large quantity of automotive scrap during the recent price weakness in flat rolled stock remained unconfirmed at Detroit, although the story is wide-spread.

New York

New commitments have been made by the International Scrap Convention, the bulk of the material being for Great Britain. Combined with the last sale, this brings recent orders to over 500,000 tons. Much of this new tonnage is to be shipped from Gulf ports. Prices on Nos. 1 and 2 steel remained unchanged at \$15 and \$13.50 respectively, but railroad steel brought slightly less than on the last order. Truck load buying prices are unchanged here, but one broker has lowered his offerings on car shipments to Jersey docks. Buying prices for domestic shipment are unchanged.

Boston

The export market continues very active with prices firm and unchanged. Here, three boats are loading and one waiting for a berth; another is loading at Providence. The congestion at Mystic Wharf has been somewhat relieved, but at the Boston Army Base is quite serious, because of inadequate crane facilities.

A Weirton mill is in the market for ordinary steel turnings on a basis of \$2.85 a ton on cars and for short shoveling turnings at \$3.50, while an eastern Pennsylvania mill is inquiring for ordinary turnings for which brokers can pay \$3 to \$3.10 on cars. Sellers, however, are sitting tight. The American Steel & Wire Co., Worcester, is buying an occasional tonnage of No. 1 steel at around \$13.50 a ton delivered. The Washburn Wire Co., Phillipsdale, R. I., is holding up shipments.

Toronto

Stove plate again came under the hammer in the Canadian scrap markets and was knocked down another \$1 per ton during the week with dealers now offering \$8 per gross ton. Other materials, however, held unchanged. Local dealers now state they believe they have reached bottom in the recent price cutting run and the next move will be upward, following the example set in many United States' centers. Steel mills are taking delivery of heavy melting steel, mostly No. 2, at old prices and show no immediate indication of raising their bids. Turnings and borings are stagnant. Machinery cast was more active during the week and melters again are buying.

Airplane Engine Plant To Be Built Near Glasgow

CONSTRUCTION of a \$20,000,000 airplane engine factory by the Rolls-Royce Co. on behalf of the Air Ministry of Great Britain will shortly begin at a site about four miles from Glasgow, according to a report from Consul H. A. Bowman, made public by the Department of Commerce.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
Railroad hvy. mltng.	16.00 to 16.50
No. 2 hvy. mltng. steel.	13.75 to 14.25
Scrap rails	16.00 to 16.50
Rails 3 ft. and under.	17.50 to 18.00
Comp. sheet steel	15.00 to 15.50
Hand bundled sheets.	14.00 to 14.50
Hvy. steel axle turn.	13.50 to 14.00
Machine shop turn.	9.00 to 9.50
Short shov. turn.	10.00 to 10.50
Mixed bor. & turn.	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels.	14.50 to 15.00
Hvy. breakable cast.	12.50 to 13.00
No. 1 cupola cast.	15.00 to 15.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	18.00 to 18.50
Rolled steel wheels.	18.00 to 18.50
Low phos. billet crops.	18.50 to 19.00
Low phos. punchings.	17.50 to 18.00
Low phos. plate	16.00 to 17.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.50
No. 2 hvy. mltng. steel.	13.50
Hydraulic bund. new.	\$14.50 to 15.00
Hydraulic bund. old.	11.50 to 12.00
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels.	16.00
Hvy. breakable cast.	14.50 to 15.00
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.50 to 16.00
Machine shop turn.	8.50 to 9.00
No. 1 blast furnace.	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings.	10.00 to 10.50
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles.	17.00 to 17.50
Rolled steel wheels.	17.00 to 17.50
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire.	12.00 to 12.50
Cast boring (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel	\$13.25 to \$13.75
Auto. hvy. mltng. steel	
alloy free	11.75 to 12.25
No. 2 auto steel	10.25 to 10.75
Shoveling steel	13.25 to 13.75
Factory bundles	12.25 to 12.75
Dealers' bundles	11.25 to 11.75
Drop forge flashings.	9.25 to 9.75
No. 1 busheling	11.75 to 12.25
No. 2 busheling, old.	5.25 to 5.75
Rolled carwheels	14.50 to 15.00
Railroad tires, cut	15.00 to 15.50
Railroad leaf springs.	14.50 to 15.00
Steel coup. & knuckles	14.25 to 14.75
Axle turnings	12.50 to 13.00
Coil springs	16.50 to 17.00
Axle turn. (elec.)	13.50 to 14.00
Low phos. punchings.	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	6.50 to 7.00
Short shov. turn.	6.50 to 7.00
Machine shop turn.	6.50 to 7.00
Re-rolling rails	18.00 to 18.50
Steel rails under 3 ft.	16.00 to 16.50
Steel rails under 2 ft.	16.50 to 17.00
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.50 to 13.00
Railroad malleable	15.00 to 15.50
Agric. malleable	12.00 to 12.50

Per Net Ton

Iron car axles	\$18.00 to \$18.50
Steel car axles	17.50 to 18.00
Locomotive tires	13.00 to 13.50
Pipes and flues	8.50 to 9.00
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast	12.50 to 13.00
No. 1 railroad cast.	11.00 to 11.50
No. 1 agric. cast	10.00 to 10.50
Stove plate	7.75 to 8.25
Grate bars	7.75 to 8.25
Brake shoes	9.50 to 10.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel	14.00 to 14.50
Low phos. plate	16.25 to 16.75
No. 1 busheling	14.25 to 14.75
Hydraulic bundles	14.50 to 15.00
Machine shop turn.	9.00 to 9.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	13.00 to 13.50
Comp. sheet steel.	13.50 to 14.00
Light bund. stampings	9.75 to 10.25
Drop forge flashings.	11.50 to 12.00
Machine shop turn.	7.50 to 8.00
Short shov. turn.	8.00 to 8.50
No. 1 busheling	13.00 to 13.50
Steel axle turnings.	10.50 to 11.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	8.00 to 8.50
Mixed bor. & turn.	8.00 to 8.50
No. 2 busheling	8.25 to 8.75
No. 1 cupola cast	15.50 to 16.00
Railroad grate bars.	11.00 to 11.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.75 to 18.25
Rails for rolling	17.50 to 18.00
Railroad malleable	15.00 to 15.50
Cast iron carwheels	13.50 to 14.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$13.00 to \$13.50
Railroad hvy. mltng.	13.50 to 14.00
No. 2 hvy. mltng. steel.	11.00 to 11.50
Scrap rails	13.50 to 14.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraulic bundles.	10.00 to 10.50
Drop forge flashings.	11.00 to 11.50
No. 1 busheling	11.00 to 11.50
Machine shop turn.	6.00 to 6.50
Knuckles & couplers.	15.00 to 15.50
Coil & leaf springs.	15.00 to 15.50
Rolled steel wheels.	15.00 to 15.50
Shov. turnings	7.00 to 7.50
Mixed bor. & turn.	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 1 machinery cast.	15.00 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels	13.50 to 14.00
Railroad malleable	15.00 to 15.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$11.75 to \$12.25
No. 1 hvy. melting.	11.50 to 12.00
No. 2 hvy. melting.	10.50 to 11.00
No. 1 locomotive tires.	12.25 to 12.75
Misc. stand. sec. rails.	13.00 to 13.50
Railroad springs	14.00 to 14.50
Bundled sheets	7.00 to 7.50
No. 1 busheling	7.50 to 8.00
Cast bor. & turn.	2.50 to 3.00
Machine shop turn.	4.50 to 5.00
Heavy turnings	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Steel car axles	17.00 to 17.50
No. 1 RR. wrought.	9.75 to 10.25
No. 2 RR. wrought.	11.50 to 12.00
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels.	14.00 to 14.50
No. 1 machinery cast.	14.50 to 15.00
Railroad malleable	12.00 to 12.50
No. 1 railroad cast.	12.00 to 12.50
Stove plate	7.50 to 8.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	8.75 to 9.25
Scrap rails for mltng.	14.50 to 15.00
Loose sheet clippings.	6.50 to 7.00
Hydru. b'ndled sheets	10.50 to 11.00
Cast iron borings	3.25 to 3.75
Machine shop turn.	4.50 to 5.00
No. 1 busheling	7.25 to 7.75
No. 2 busheling	2.25 to 2.75
Rails for rolling	16.50 to 17.00
No. 1 locomotive tires.	13.25 to 13.75
Short rails	17.25 to 17.75
Cast iron carwheels.	12.50 to 13.00
No. 1 machinery cast.	12.00 to 12.50
No. 1 railroad cast.	12.00 to 12.50
Burnt cast	6.25 to 6.75
Stove plate	6.25 to 6.75
Agricul. malleable	10.75 to 11.25
Railroad malleable	13.25 to 13.75
Mixed hvy. cast	10.50 to 11.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.	\$13.00
Scrap steel rails	\$13.50 to 14.00
Short shov. turnings.	7.50
Stove plate	9.50
Steel axles	18.50
Iron axles	18.50
No. 1 RR. wrought.	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast.	15.00
Tramcar wheels	14.50 to 15.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. in- trial steel	\$10.00 to \$10.50
No. 2 hvy. mltng. steel.	9.00 to 9.50
Borings and turnings.	5.00 to 5.50
Long turnings	4.75 to 5.25
Short shov. turnings.	5.75 to 6.25
No. 1 machinery cast.	12.50 to 13.00
Automotive cast	13.00 to 13.50
Hvy. breakable cast.	9.00 to 9.50
Stove plate	7.75 to 8.25
Hydraul. comp. sheets.	11.25 to 11.75
New factory bushel.	9.50 to 10.00
Sheet clippings	7.25 to 8.25
Flashings	9.50 to 10.00
Low phos. plate scrap.	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	8.50 to 9.00
Hvy. breakable cast.	10.50 to 11.00
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	20.00 to 20.50
Shafting	15.50 to 16.00
No. 1 RR. wrought.	11.00 to 11.50
No. 1 wrought long.	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*.	4.00 to 4.50
Cast borings*.	3.50 to 4.00
No. 1 blast furnace.	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	\$13.50 to \$14.00
No. 2 cast†	10.50 to 11.00

* \$1.50 less for truck loads.
† Northern N. J. prices are \$2 to \$2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

Breakable cast	\$9.40
Machine shop turn.	\$2.88 to 3.30
Mixed bor. & turn.	2.25
Bun. skeleton long.	7.65
Shafting	15.25 to 15.50
Cast bor. chemical.	5.00 to 6.00
Per gross ton delivered consumers' yards:	
Textile cast	\$13.50 to \$14.00
No. 1 machine cast.	13.00 to 14.00
Per gross ton delivered dealers' yards:	
No. 1 hvy. mltng. steel.	\$11.75 to \$12.00
No. 2 steel	10.50 to 10.75

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$12.00 to \$13.00
No. 2 hvy. mltng. steel.	11.00 to 12.00

CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mltng. steel.	\$9.25 \$8.75
No. 2 hvy. mltng. steel.	8.00 7.50
Mixed dealers steel.	6.75 6.25
Drop forge flashings.	8.25 7.75
New loose clippings.	4.25 3.75
Busheling	3.75 3.25
Scrap pipe	4.25 3.75
Steel turnings	4.25 3.75
Cast borings	3.75 3.25
Machinery cast	14.00 13.50
Dealers cast	12.00 11.50
Stove plate	8.00 7.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel.	\$12.00 to \$12.50
No. 2 hvy. mltng. steel.	10.50 to 11.00
No. 2 cast	10.50 to 11.00
Stove plate	9.50 to 10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$13.75 to \$14.00
No. 2 hvy. mltng. steel.	12.75 to 13.00
Rails (scrap)	14.00 to 14.25

Philadelphia, delivered alongside boats, Port Richmond.

No. 1 hvy. mltng. steel.	\$15.00 to \$15.25
No. 2 hvy. mltng. steel.	13.50 to 13.75

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Rerolling Per Gross Ton \$34.00
Forging quality 40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Open hearth or bessemer Per Gross Ton \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Grooved, universal and sheared Per Lb. 1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Pittsburgh, Chicago or Cleveland Per Gross Ton \$43.00
Worcester, Mass. 45.00
Birmingham 43.00
San Francisco 52.00
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham 2.15c.
Detroit, delivered 2.25c.
Duluth 2.25c.
Philadelphia, delivered 2.47c.
New York 2.49c.
On cars dock Gulf ports 2.50c.
On cars dock Pacific ports 2.75c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham 2.00c.
On cars dock Tex. Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. 1.80c. to 2.05c.
Detroit, delivered 1.90c. to 2.15c.
On cars dock Tex. Gulf ports 2.15c. to 2.40c.
On cars dock Pacific ports 2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham 1.70c. to 1.90c.
Detroit, delivered 1.80c. to 2.00c.
On cars dock Tex. Gulf ports 2.05c. to 2.25c.
On cars dock Pacific ports 2.35c.

IRON BARS

Chicago and Terre Haute 2.15c.
Pittsburgh (refined) 3.60c.

COLD FINISHED BARS AND SHAFTING*

Base per Lb.

Pittsburgh, Buffalo, Cleveland, Chicago and Gary 2.65c.
Detroit 2.70c.

* In quantities of 10,000 to 19,999 lb.

PLATES

Base per Lb.

Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c.*
Philadelphia, del'd 2.05c. to 2.15c.
New York, del'd 2.19c. to 2.29c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.60c.
Wrought iron plates, P'tg. 3.80c.
* Subject to concessions, particularly in the East, of \$2 a ton.

FLOOR PLATES

Pittsburgh or Chicago 3.35c.
New York, del'd 3.71c.
On cars dock Gulf ports 3.70c.
On cars dock Pacific ports 3.95c.

STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham 2.10c.
Philadelphia, del'd 2.215c.
New York, del'd 2.27c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.
On cars dock Gulf ports 2.85c.
On cars dock Pacific ports 2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton \$40.00
Angle bars, per 100 lb. 2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton \$40.00
Light rails (from rail steel) per gross ton 39.00

Base per Lb.

Cut spikes 3.00c.
Screw spikes 4.55c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast ports. 2.25c.
Track bolts, to steam railroads 4.15c.
Track bolts to jobbers, all sizes (per 100 counts) 65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago 2.00c.
Detroit, delivered 2.10c.
Philadelphia, delivered 2.17c.
Granite City 2.10c.
On cars dock Pacific ports 2.50c.
Wrought iron, Pittsburgh 4.10c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago 3.05c.
Detroit, delivered 3.15c.
Granite City 3.15c.
Philadelphia, delivered 3.37c.
On cars dock Pacific ports 3.65c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from \$4 to \$8 a ton were prevalent. Concessions withdrawn, on May 15.

Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham 3.50c.
Philadelphia, del'd 3.67c.
Granite City 3.60c.
On cars dock Pacific ports 4.00c.
Wrought iron Pittsburgh 6.10c.

Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.

Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Motor 4.95c.
Dynamo 5.65c.
Transformer 72 6.15c.
Transformer 65 7.15c.
Transformer 58 7.65c.
Transformer 52 8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary 3.80c.
F.o.b. cars dock Pacific ports. 4.50c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland 3.35c.
Detroit, del'd 3.45c.
Granite City 3.45c.
On cars dock Pacific ports 3.95c.

TIN MILL PRODUCTS

*Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chicago and Gary \$5.00
Standard cokes, Granite City 5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

Per Base Box

Granite City \$4.40
Pittsburgh or Gary 4.30

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C. \$12.00
15-lb. coating I.C. 14.00
20-lb. coating I.C. 15.00
25-lb. coating I.C. 16.00
30-lb. coating I.C. 17.25
40-lb. coating I.C. 19.50

Black Plate, 29 gage and lighter
Pittsburgh, Chicago and Gary 3.05c.
Granite City 3.15c.
On cars dock Pacific ports, boxed 4.00c.

HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham 2.00c.
Detroit, delivered 2.10c.

Cooperage Stock

Pittsburgh & Chicago 2.10c.

From May 10 up to and including May 15, reductions in the base price of hot rolled strip running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15. Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

COLD ROLLED STRIP*

Base per Lb.

Pittsburgh, Youngstown or Cleveland 2.80c.
Chicago 2.90c.
Detroit, delivered 2.90c.
Worcester 3.00c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland 2.95c.
Detroit, delivered 3.05c.
Worcester 3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to \$4 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED SPRING STEEL

Pittsburgh and Cleveland Worcester

Carbon	0.26-0.50%	2.80c.	3.00c.
Carbon	0.51-0.75	4.30c.	4.50c.
Carbon	0.76-1.00	6.15c.	6.35c.
Carbon	1.01-1.25	8.35c.	8.55c.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.90
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa.	21.00
Toledo, Chicago, Granite City, Cleveland and Youngstown... ..	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.90
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa.	20.50
Toledo, Chicago, Granite City, Cleveland and Youngstown... ..	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	\$22.00
F.o.b. Everett, Mass.	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown ...	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$26.50
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Gray Forge

Valley or Pittsburgh furnace... ..	\$20.50
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Charcoal

Lake Superior furnace	\$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Foundry iron	\$24.50 base
Malleable	25.00 base
Basic	24.50 base

Toronto

Foundry iron	\$22.50 base
Malleable	23.00 base
Basic	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Domestic, 80% (carload)	\$80.00

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size	
50% (carload lots, bulk)	\$69.50*
50% (ton lots in 50 gal. bbl.)... ..	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)... ..	139.90*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio	
Per Gross Ton	
10.00 to 10.50%	\$30.50
For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.	
For each unit of manganese over 2%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	

Silvery Iron

F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$24.50
For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton. The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.	

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract	
4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract	
3% carbon	\$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads... ..	\$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovandium, contract, per lb. contained V., delivered	\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots	\$2.25†
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	\$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville	\$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.
Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo, f.o.b. Langeloth, Pa.	80c.

* Spot prices are \$5 per ton higher.
† Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports	
Per Gross Ton	
Old range, Bessemer, 51.50%... ..	\$5.25
Old range, non-Bessemer, 51.50%... ..	5.10
Messabi, Bessemer, 51.50%... ..	5.10
Messabi, non-Bessemer, 51.50%... ..	4.95
High phosphorus, 51.50%... ..	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore	
Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c.
Iron, basic or foundry, Swedish, aver. 65% iron... ..	11c.
Iron, basic or foundry, Russian, aver. 65% iron... ..	Nominal
Man., Caucasian, washed 52%	29c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	28c.
Man., Brazilian, 46 to 48%	27c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	\$18.00
Tungsten, domestic, scheelite delivered	\$15.00 to \$16.00
Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	\$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	22.00
Turkish, 48-49%	22.50
Turkish, 45-56%	19.50
Turkish, 40-41%	17.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	\$24.00
48-49%	23.50

FLUORSPAR

Per Net Ton	
Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$13.00
Domestic, f.o.b. Ohio River landing barges	19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	19.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid... ..	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines... ..	31.50

FUEL OIL

Per Gal.	
No. 2, f.o.b. Bayonne... ..	3.875c.
No. 6, f.o.b. Bayonne... ..	2.50c.
No. 5 Bur. Stds., del'd Chicago 3.25c.	
No. 6 Bur. Stds., del'd Chicago 2.75c.	
No. 3 distillate, del'd Cleve'd. 5.50c.	
No. 4 industrial, del'd Cleve'd. 5.25c.	
No. 5 industrial, del'd Cleve'd. 3.00c.	
No. 6 industrial, del'd Cleve'd. 2.75c.	

COKE

Per Net Ton	
Furnace, f.o.b. Connells-ville, Prompt	\$3.75
Furnace, f.o.b. Connells-ville, Prompt	\$4.75 to 5.50
Foundry, by - product Chicago ovens	10.25
Foundry, by - product, del'd New England... ..	12.50
Foundry, by - product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by - product, Philadelphia	10.95
Foundry, by - product, delivered Cleveland ..	10.30
Foundry, by - product, delivered Cincinnati ..	9.75
Foundry, Birmingham... ..	7.50
Foundry, by - product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

REINFORCING STEEL

... Awards of 8000 tons; 11,900 tons in new projects.

ATLANTIC STATES AWARDS

- 1400 Tons, Franklin County, Pa., Kittatinny-Blue Mountain tunnel, Pennsylvania Turnpike Commission, to Bethlehem Steel Co., Bethlehem, Pa.
- 700 Tons, Brooklyn, highway project, to Bethlehem Steel Co., Bethlehem, Pa., through P. T. Cox Construction Co., New York.
- 475 Tons, Franklin County, Rays Hill tunnel, Pennsylvania Turnpike Commission, to Jones & Laughlin Steel Corp., Pittsburgh, through Mason & Hanger, contractors.
- 300 Tons, Oswego, N. Y., power station, to Truscon Steel Co., Buffalo.
- 250 Tons, Hartford, Conn., pumping station, to Bethlehem Steel Co., Bethlehem, Pa., F. H. McGraw & Co., Inc., Hartford, contractor.
- 200 Tons, Belcamp, Md., shoe factory and employees' residences, to Bethlehem Steel Co., Bethlehem, Pa., through Price Construction Co., contractor.
- 150 Tons, Washington, ward building No. 2, Gallinger Hospital, to Sweets Steel Co., Williamsport, Pa., through Jeffries-Dyer, Inc., contractor.
- 100 Tons, New York, New York Central freight terminal, to Wickwire Spencer Steel Co., New York.
- 100 Tons, Bridgeport, N. J., Raccoon Creek bridge, to Truscon Steel Co., Youngstown, through F. A. Canuso & Son, Philadelphia, contractors.
- 100 Tons, Philadelphia, Horn & Hardart Baking Co., commissary building, to Truscon Steel Co., Youngstown, through Murphy-Quigley & Co., contractors.

CENTRAL AND WESTERN STATES

- 1700 Tons, Seattle, court house, to Bethlehem Steel Co., Seattle; through M. P. Severin, Chicago, contractor.
- 500 Tons, Fort Wayne, Ind., sewage plant, to Republic Steel Corp., Cleveland, through Truscon Steel Co.
- 450 Tons, Peoria, Ill., laboratory for Department of Agriculture, to Laclede Steel Co., St. Louis, through O'Neil Construction Co., general contractor.
- 400 Tons, Marion, Ind., sewage plant, to Republic Steel Corp., Cleveland, through Truscon Steel Co.
- 385 Tons, Honolulu, T. H. Kamehameha school, to Columbia Steel Co., San Francisco; through E. E. Black, Honolulu, contractor.
- 250 Tons, Dahlgren, Va., Potomac River bridge superstructure, to Bethlehem Steel Co., Bethlehem, Pa., through Harris Structural Steel Co., contractor.
- 200 Tons, Richmond, Va., State Library building superstructure, to Bethlehem Steel Co., through Doyle & Russel, contractors.
- 103 Tons, Oakland, Cal., Treasury Department, San Francisco, Invitation 7615, to Columbia Steel Co., San Francisco.
- 100 Tons, Troy, Ohio, Hobart Mfg. Co., factory, to Republic Steel Corp., Cleveland, through Truscon Steel Co.
- 100 Tons, Beatrice, Neb., auditorium, to Sheffield Steel Corp., Kansas City.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

- 2500 Tons, Boston, New England Mutual Life Insurance Co. building; previously reported 2000 tons.
- 1000 Tons, Quincy, Mass., Procter & Gamble Co. plant.
- 700 Tons, Cumberland County, Pa., highway project, Pennsylvania Turnpike Commission.
- 500 Tons, Washington, Rock Creek diversion sewers, section 2.
- 450 Tons, Somerset and Bedford Counties, Pa., Pennsylvania Turnpike Commission, section 9 C-2-10 and 11.
- 456 Tons, Oneida County, N. Y., mostly mesh, highway project R. C. 4041; bids due July 7.
- 390 Tons, Somerset County, Pa., Pennsylvania Turnpike Commission, section 8 B-1.
- 330 Tons, Monroe and Ontario Counties, N. Y., mostly mesh, highway project R. C. 4018; bids due July 7.
- 305 Tons, Westmoreland County, Pa., Pennsylvania Turnpike Commission, section 2-C.
- 264 Tons, Sayreville and Woodbridge, N. J., Raritan River bridge, contract No. 3.

- 255 Tons, Passaic, N. J., route 25, section 30B, approach piers and highway, Ole Hansen, Ventnor City, N. J., low bidder.
- 236 Tons, Herkimer County, N. Y., highway project R. C. 4040; bids close July 7.
- 230 Tons, Erie County, mostly mesh, highway project R. C. 4037; bids received until July 7.
- 218 Tons, Springfield, Mass., dike.
- 215 Tons, Northampton, Mass., Mill River diversion canal.
- 166 Tons, Steuben County, N. Y., mostly mesh, includes 23 tons structural steel, highway project R. C. 4043; bids taken until July 7.
- 125 Tons, Gloucester County, Pa., highway project, route 51, section 1, Pennsylvania Turnpike Commission; bids close July 7.
- 109 Tons, Chicopee, Mass., dike.
- 105 Tons, Buffalo, Hopkins and Marilla Streets grade elimination over Baltimore & Ohio Railroad.
- 100 Tons, Stratford, Conn., road and bridge; Peter Mitchel, Inc., Greenwich, Conn., contractor.

CENTRAL AND WESTERN STATES

- 3350 Tons, Chicago, section 5-S, subway.
- 371 Tons, Santa Monica, Cal., Colorado underpass; bids July 5.
- 270 Tons, Great Falls, Mont., Civic Center.
- 250 Tons, Everett, Wash., East approach Snohomish River bridge; bids June 27.
- 200 Tons, Oberlin, Ohio, Oberlin College auditorium; bids July 15.
- 155 Tons, Talmadge, Cal., Mendocino County State Hospital; Azevedo Construction Co., Sacramento, Cal., low bidder on general contract.
- 150 Tons, Wausau, Wis., sewage plant.
- 130 Tons, Seattle, Coca-Cola plant; Teufel & Carlson, Seattle, general contractors.
- 125 Tons, Cleveland, William D. Howells School; bids June 23.
- 124 Tons, Chicago, two-story office building, Randolph & State; bids in.
- 100 Tons, Tacoma, Wash., undercrossing; bids June 27.
- Unstated tonnage, Chicago, Edison Co., switch house and transmission terminal; bids June 24.
- Unstated tonnage, Chicago, Negro housing project.

ERRATUM

TO correct an error made in the issue of April 6 on p. 58, we illustrate below the latest design of Unbrako self-locking hollow set screw with knurling around the point, a product of the Standard Pressed Steel Co., Jenkintown, Pa. The obsolete form with serrations on the two upper threads was previously illustrated in an article concerning self-locking screw fasteners. The knurled edges on the cup cannot harm the threads of the tapped hole, yet effectively prevent the screw from working loose even though lightly set with a small hex-bar wrench.



Keystone Steel & Wire 50 Years Old

THE Keystone Steel & Wire Co., Peoria, Ill., which was founded 50 years ago, gave a dinner Friday evening, June 16, at the Pere Marquette Hotel, Peoria, for the Keystone 25-Year Club, composed of employees who have been with the company 25 years or longer. Six additional employees of the company became eligible for membership in the club on this occasion.

In a booklet commemorating the dinner, W. H. Sommer, president of the company and son of the founder, Peter Sommer, published an interesting article telling of the beginning of the Keystone business a half century ago.

Peter Sommer was a struggling farmer in Tazewell County, Ill., and one of his problems was the building of a fence. The first wire fence was made by stretching smooth wires, graduated in spacing, and fastening the stay wires to the strand wires with washers. The device for making this fence consisted of a bar of hardwood with bolts or pins properly spaced between, and a special hooked bar which made a crimp in the strand wires. Washers were then slipped over the crimp and a stay wire inserted from the top. The crimps were then reduced in depth and a slight crimp also put into the stay wire. This fence did not prove entirely satisfactory so a further development consisted of twisting the stay and strand wires together, which was the development that finally resulted in the construction of a machine for the making of the first Keystone woven wire fence. At first Peter Sommer made fence only for himself and neighbors, but the business grew rapidly, resulting in three different locations during the company's 50 years of existence—the first move to Tremont in 1891, then to Peoria in 1895 and then in 1901 to the present site in South Bartonville, Ill.

The Brown & Sharp Mfg. Co., Providence, R. I., has filed a registration statement with the Securities and Exchange Commission covering the issuance of 34,000 shares of \$50 par value common stock, effective June 27 unless amended. The stock will be sold by bankers at a price to be announced at a later date.

... CANADA ...

... *Iron and steel demand is steady in small lots.*

TORONTO, June 20—New business is steady in the Canadian iron and steel markets with demand holding to small quantity lots and consumers buying for immediate needs only. Sheets and bars are still on the most active list while other lines are spotty. Reinforcing bars are creating some interest and there are several bids in the market for lots up to 300 tons, while other awards pending show a total of around 2000 tons. Some 5000 tons of structural steel orders also are reported but there is nothing definite as to closing dates.

The automobile industry, electrical equipment manufacturers and sheet metal workers are furnishing the bulk of new business, while warehouse operators are entering the market at frequent intervals for supplies.

CAST IRON PIPE

Sherborn, Mass., is having a survey made for a water system, but has not decided when bids for pipe will be asked. Bayard F. Snow, 14 Beacon Street, Boston, is engineer.

Norwich-Southbury, Conn., have placed ton-nages of various sized pipe with Florence Pipe Co., Philadelphia, Pa.

Lincoln, Mass., has closed bids on 10,400 ft. of 8-in. pipe which will be purchased through a contractor.

North Kingston, R. I., will close bids June 23 on 25,000 ft. of 12-in. pipe, 11,900 ft. of 10-in., 9400 ft. of 8-in., 10,900 ft. of 6-in., 200 ft. of 4-in. and 27 tons of fittings.

Meridian, Miss., plans pipe line extensions in water system, including 24 and 16-in. for main water supply. Bond issue of \$200,000 has been approved for this, construction of 5,000,000-gal. reservoir and other waterworks installation.

McGuffey, Ohio, plans pipe lines for water system and other waterworks installation. Surveys and estimates of cost will be made by Edison Ellis, Van Wert, Ohio, consulting engineer.

Board of Lorain County Commissioners, Elyria, Ohio, plans extensions in water pipe lines. H. L. Dunham, Courthouse, is county engineer.

Church Point, La., asks bids until June 27 for 4000 ft. of 4-in. and 1500 ft. of 2-in. for extensions in water system; also for fire hydrants and other waterworks equipment. M. J. Goudeau, Jr., Opelousas, La., is consulting engineer.

Metropolitan Utilities District, Eighteenth and Harney Streets, Omaha, Neb., Col. T. A. Leisen, secretary, plans pipe line extensions in water system in recently created districts Nos. 1565, 1566 and 1568. This is part of an expansion program in pipe lines for water and gas systems to be carried out by District, for which fund of about \$760,000 has been arranged through Federal financing, including other waterworks equipment and gas distribution facilities.

Redondo Water District, Redondo, Wash.,

Producing mills report sales running slightly ahead of the 1938 level with indications of further improvement as the year advances. Prices, however, remain firm and unchanged and it appears that consumers are taking advantage of this situation to hold purchases to their immediate needs, having no fear of being caught in a wave of advancing prices.

Pig iron demand held practically unchanged for the week. Melters are not interested beyond current needs and the large melters in the Toronto area are carrying sufficient stocks of iron to keep them supplied for some time ahead. Most of the present buying is from melters in the smaller sections such as Brockville and Hamilton. Agricultural implement makers are taking iron in small tonnage lots, while there is little or no demand from radiator makers. Forward delivery contract placing is at a standstill and local blast furnace representatives do not look for any change in present buying conditions as long as present prices are assured.

recently organized under direction of Redondo Improvement Club, Percy Ball, president, plans pipe lines for water system and other waterworks installation. Estimates of cost are being made and financing will be arranged soon.

King County Metropolitan Water District 59, Seattle, Bailey & Croson, Insurance Building, attorneys and representatives, has engaged Parker & Hill, Smith Tower Building, consulting engineers, to make surveys and estimates of cost for water system in district between Renton on north and Snohomish County line on south, and east from Lake Washington to foothill district of Cascade Mountains. Installation will require about 1500 miles of pipe.

Lakeridge, Inc., Fourth Avenue Building, Seattle, plans about four miles of 2, 4 and 6-in. pipe for water system in a city development area. Project will be carried out in conjunction with city water department.

Columbia City, Ore., has taken bids on 17,000 feet of 3, 4 and 6-in. pipe.

Burbank, Cal., has taken bids on 167 tons of 4, 6 and 8-in. pipe.

Alhambra, Cal., has awarded 150 tons of 8-in. pipe to National Cast Iron Pipe Co., Los Angeles.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: 1613 tons of chrome ore from South Africa; 9 tons of steel billets, 28 tons of steel tubes and 9 tons of wire rods from Sweden; 7 tons of wire rods, 26 tons of steel bands, 16 tons of steel bars and 128 tons of structural shapes from Belgium; 27 tons of steel bands and 19 tons of steel bars from France.

... GREAT BRITAIN ...

... *Reported purchase of 500,000 tons of scrap not officially confirmed.*

LONDON, June 20 (By Cable)—No confirmation or denial is forthcoming on American reports of the International Scrap Convention's new purchases of 500,000 tons mainly for United Kingdom and Poland.

Welsh tin plate restriction on production will be removed entirely during the period July 3 to the end of the year owing to governmental demand and to speed up deliveries under such contracts.

Export business is not expected to develop widely as export sales are still regulated by international control. Prices are still strong, with consumers buying up to the end of the first quarter. The Government is placing further orders for air raid shelters, making in all 2,500,000 shelters. Sheet mills are consequently expected to operate at full time until early next year.

Steel in Great Britain is still active, with industrial demands expanding. Makers generally are able to keep pace with commitments but are urging customers to exercise restraint and avoid duplication orders.

Though no official statement has been made, it is expected that foundry pig iron prices will be unchanged as makers are booking for third quarter at present prices. Contrary to expectations, heavy sales in hematite have been made, despite the price reduction from July to October. Consumers are unable to delay taking deliveries.

The Continent reports a falling off in Chinese demand, but otherwise the market is again normal with good business in semi-finished steel with the United Kingdom and bars and plates with Holland and Sweden. Prices are firm.

The Thin Sheet Cartel meets in London on Monday and Tuesday of next week.

Imports in the United Kingdom in May of all kinds totaled 142,000 tons, of which 3700 tons was from the United States. Scrap imports amounted to 32,000 tons. Iron and steel exports of all kinds totaled 168,000 tons, including black sheets which was 5500 tons, galvanized sheets which was 14,700 tons and tin plate 32,000 tons.

...NON-FERROUS...

... Active trading and higher London prices bring \$2 a ton advance in domestic lead quotations . . . Failure of buffer pool to sell nearby tin supplies forces sharp advance in cash standards in London

NEW YORK, June 20—Despite the tenseness generated by the Far East situation, most non-ferrous prices abroad moved higher during the week, lending encouragement to domestic traders. The higher prices abroad had little effect on domestic buyers, however, who were generally content to stand on the sidelines and await further developments. The one exception to this attitude was the lead market, where heavy buying of both June and July metal contin-

ued unabated. The chief obstacle to an advance in lead prices during the current buying wave was removed early last week, with the steady improvement in London prices, and on Wednesday domestic producers announced a \$1 increase in quotations, followed by an additional \$1 yesterday, bringing prices to 4.85c. per lb., New York. Buying was well diversified all week with respect to consuming industries, and was divided fairly evenly between June and July. This

morning's London price on spot was 3.08c. per lb., against 2.99c. a week ago.

Tin

Chief interest of tin buyers in the past week centered on the five-point advance in quotas to 45 per cent for the third quarter. In view of the current shortage in prompt Straits, domestic buyers had hope of a much larger increase in quotas. In London, cash standards rose from £225 10s. on Tuesday a week ago, to £228 15s. this morning, reflecting the growing tightness in the nearby supplies there. By contrast, three months metal advanced from £224 10s. a week ago to £225 this morning. It is thought that the Tin Council is not lending tin on the market with the aim of advancing prices to the £230-level. When that point is reached, it is expected that part of the buffer pool will be sold outright. Domestic prices moved slightly higher during the week, but were not able to keep pace with the London market.

Copper

Better foreign prices offered some encouragement to domestic sellers in the past week, but had little influence on buyers. The sales volume, which has been ranging from 1500 to 2500 tons daily, showed no important change from recent levels and continues to be made up mostly of affiliated fabricator sales. Domestic quotations were unchanged all week at 10c. per lb., Connecticut Valley, but this morning's foreign price of 10.05c. per lb., represented an increase of eight points over a week ago.

Zinc

Sales of prime Western metal tapered to 4360 tons in the past week from 6874 in the preceding week, but little significance was attached to this move in view of the comparatively unchanged volume of shipments. The past week's deliveries were 4546 tons against 4071 tons in the previous period. Quotations here are unchanged at 4.89c. per lb., New York, while abroad the demand for spelter for air raid shelters boosted prices four points during the week to 2.96c. per lb., London, this morning. Shipments of brass and bronze ingots and billets in May, as reported by the Non-Ferrous Ingot Metal Institute, were off slightly to 4543 tons from 4657 tons in April. In May, 1938, deliveries were 2782 tons. The May volume, while below the monthly average of 4921 tons for the first five months of the present year, were well above the 3821-ton average of 1938.

NON-FERROUS PRICES

Cents per lb. for early delivery

	June 14	June 15	June 16	June 17	June 19	June 20
Copper, Electrolytic ¹	10.00	10.00	10.00	10.00	10.00	10.00
Copper, Lake	10.00	10.00	10.00	10.00	10.00	10.00
Tin, Straits, New York	48.70	48.75	48.75	48.00	49.125
Zinc, East St. Louis ²	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis ³	4.65	4.65	4.65	4.65	4.70	4.70

¹ Delivered Conn. Valley. Deduct ¼c. for New York delivery. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits pig	50.25c.	52.00c.
Copper, Lake	11.25c.	11.125c.
Copper, electro	11.125c.	11.125c.
Copper, Castings	10.75c.	10.875c.
*Copper sheets, hot-rolled	18.12c.	18.12c.
*High brass sheets	16.48c.	16.48c.
*Seamless brass tubes	19.23c.	19.23c.
*Seamless copper tubes	18.62c.	18.62c.
*Brass rods	11.85c.	11.85c.
Zinc slabs	6.15c.	6.90c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.85c.	5.70c.
Lead, bar	6.45c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ¾	29.625c.	29.75c.
Babbitt metal, commercial grade	21.50c.	21.75c.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.875c.	9.50c.
Copper, hvy. and wire	6.875c.	7.25c.
Copper, light and bottoms	6.00c.	6.25c.
Brass, heavy	4.125c.	4.625c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.00c.	7.50c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or comp. turnings	5.87c.	6.375c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.25c.	13.75c.
Zinc	2.125c.	3.375c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 12c. a lb. QUICKSILVER, \$88-\$89 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.25c. a lb.

FABRICATED STEEL

... Lettings higher at 23,300 tons as against 17,500 tons last week ... New projects decline to 15,700 tons from 25,800 tons a week ago ... Plate awards call for 1275 tons.

NORTH ATLANTIC STATES AWARDS

- 12,000 Tons, Ludlow Ferry, Md., Potomac River bridge, to Harris Structural Steel Co., Plainfield, N. J.
- 800 Tons, Lancaster, Pa., warehouse addition, Armstrong Cork Co., to American Bridge Co., Pittsburgh.
- 755 Tons, State of Pennsylvania, bridge over Juniata River for Pennsylvania Turnpike Commission, to Phoenix Bridge Co., Phoenixville, Pa.
- 510 Tons, Parlin, N. J., addition to process building and miscellaneous supports, Hercules Powder Co., to American Bridge Co., Pittsburgh.
- 400 Tons, Somerset County, Pa., highway bridges, Pennsylvania Turnpike Commission, to Bethlehem Steel Co., Bethlehem, Pa.
- 345 Tons, Forest Hills, N. Y., telephone building, to Ingalls Iron Works Co., Birmingham.
- 300 Tons, Fulton County, Pa., highway bridges, Pennsylvania Turnpike Commission, to Bethlehem Steel Co., Bethlehem, Pa.
- 205 Tons, Westchester County, N. Y., contract No. 417, to American Bridge Co., Pittsburgh.
- 190 Tons, Wyndmoor, Pa., service building and agricultural laboratory, to Lehigh Structural Steel Co., Allentown, Pa.
- 175 Tons, Parlin, N. J., recovery building, Hercules Powder Co., to unnamed fabricator.
- 160 Tons, Chester, Pa., machine building, Scott Paper Co., to Bethlehem Steel Co.
- 145 Tons, Erie County, N. Y., bridge, to R. S. McMannus Steel Construction Co., Buffalo.
- 135 Tons, Lewisburg, Pa., engineering building, Bucknell University, to Lehigh Structural Steel Co., Allentown, Pa.
- 125 Tons, North Tarrytown, N. Y., municipal building, to Levine Brothers Iron Works, Yonkers, N. Y.
- 125 Tons, Iona Island, N. Y., wharf extension, to Harris Structural Steel Co., Plainfield, N. J.
- 125 Tons, Somerset County, Pa., highway bridge, Pennsylvania Turnpike Commission, to Fort Pitt Bridge Works Co., Pittsburgh.

THE SOUTH

- 270 Tons, Gadsden, Ala., B. F. Goodrich mill, to Virginia Bridge Co., Roanoke, Va.
- 240 Tons, Parker County, Tex., bridge, to Austin Brothers, Dallas, Tex.
- 170 Tons, Pike County, Miss., highway bridge, to Vincennes Bridge Co., Vincennes, Ind.
- 145 Tons, Erath County, Tex., bridge, to North Texas Iron & Steel Co., Fort Worth, Tex.

CENTRAL STATES

- 1666 Tons, Cleveland, Upper West Third Street bridge, to R. C. Mahon Co., Detroit.
- 560 Tons, Lima, Ohio, machine shop, Ohio Steel Foundry Co., to American Bridge Co., Pittsburgh.
- 520 Tons, Marion County, Iowa, beam and truss spans, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 500 Tons, Oakford, Ill., reconstruction, railroad bridge, for Government.
- 350 Tons, Holland, Mich., electric generating plant for city, to Steel Fabricating Co., Muskegon, Mich.
- 345 Tons, Chicago, Bowen High School, to Fort Pitt Bridge Works Co., Pittsburgh.
- 300 Tons, St. Louis, bulk plant for Socony Vacuum Oil Co., to Atlas Iron Works, St. Louis, through B. C. Wagner, St. Louis, general contractor.
- 195 Tons, Springfield, Ohio, Denton's store, to C. E. Morris Co., Columbus, Ohio.
- 205 Tons, Chicago, columns for reinforcing, Milwaukee Road, to American Bridge Co., Pittsburgh.
- 160 Tons, Ashland, Wis., post office, to Lakeside Bridge & Steel Co., Milwaukee.
- 150 Tons, Kalamazoo, Mich., American Cyanamid Co., to Whitehead & Kales Co., Detroit.
- 140 Tons, St. Louis, Government office and warehouse building, to Stupp Bros. Bridge & Iron Co., St. Louis.

- 130 Tons, St. Paul, Minn., fruit house for Milwaukee Road, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.
- 100 Tons, Decatur, Ill., soy bean plant, to Mississippi Valley Structural Steel Co., St. Louis.

WESTERN STATES

- 300 Tons, Denver, approach, 23rd Street viaduct, Union Pacific Railroad Co., to Midwest Steel & Iron Co., Denver.
- 229 Tons, Adams and Arapahoe Counties, Colo., bridges, to Kansas City Structural Steel Co., Kansas City, Kan.
- 178 Tons, Los Angeles, Chrysler plant, to Bethlehem Steel Co., San Francisco.
- 140 Tons, Los Angeles, Bureau of Public Works, bridge, to Consolidated Steel Corp., Los Angeles; through S. M. Milovich, Montebello, Cal.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

- 1200 Tons, New York, plant addition, National Gypsum Co.
- 950 Tons, New York, Midtown Tunnel bridges.
- 900 Tons, New Haven, Conn., Stillman College building, Yale University.
- 400 Tons, Brooklyn, Circumferential bridge, MS-39-7.
- 350 Tons, Washington, shelter and skating rink, Corson & Gruman Co.
- 263 Tons, Greene County, N. Y., includes 80 tons mesh, highway project R.C. 4039; bids close July 7.
- 250 Tons, Long Island City, N. Y., building, Stein-Davis Co.
- 235 Tons, New York, State Normal School building.
- 175 Tons, Newark, N. J., factory and office building, H. J. Heinz Co.
- 160 Tons, Monmouth County, N. J., highway project, route 4, section 40; bids close June 23.
- 150 Tons, North Pownal, Vt., State bridge.
- 150 Tons, Framingham, Mass., store building, J. J. Newberry Co.
- 150 Tons, Forest Hills, N. Y., building, Ridgewood Savings Bank.

SOUTH AND SOUTHWEST

- 996 Tons, San Saba, Tex., Colorado River bridge; bids June 27.
- 800 Tons, State of Oklahoma, five highway bridges; bids due July 10.
- 780 Tons, Marland, Okla., bridge; bids June 27.
- 425 Tons, Fort Worth, Tex., bridges, Texas & Pacific Railroad.
- 250 Tons, Broken Bow, Okla., bridge; bids June 27.
- 130 Tons, Rockport, Ky., State highway bridge.

CENTRAL STATES

- 1800 Tons, Youngstown, Cedar Street bridge superstructure; bids July 6.
- 1600 Tons, Cleveland, Columbus Road bridge; bids about July 20.
- 1000 Tons, Cleveland, Central High School; bids July 5.
- 1000 Tons, Saginaw, Mich., grade separation.
- 600 Tons, Chicago, Northwestern University, men's dormitory; R. C. Wieboldt, Chicago, contractor.
- 275 Tons, Humboldt, Iowa, State bridge, FAP-730-C.
- 250 Tons, Detroit, State highway bridge.
- 135 Tons, Cleveland, Woodhill housing project; Hunkin-Conkey Co., Cleveland, general contractor.

WESTERN STATES

- 180 Tons, Snohomish, Wash., repairs, bridge No. 455, Great Northern Railway Co.
- 125 Tons, Muir, Cal., tunnel supports.
- Unstated tonnage, Mare Island, Cal., floating crane (Specification 8975); Dravo Corp., Pittsburgh, low bidder.

FABRICATED PLATES

AWARDS

- 300 Tons, McCord Field, Wash., elevated tank (tonnage includes shapes), to Chicago Bridge & Iron Co., San Francisco.
- 295 Tons, Reno, Ind., 80,640 bbl. tank for Magnolia Petroleum Co., to Chicago Bridge & Iron Co., Chicago.

- 295 Tons, Patoka, Ill., 80,640 bbl. tank for Magnolia Pipe Line Co., to Chicago Bridge & Iron Co., Chicago.
- 280 Tons, East Boston, two oil storage tanks for State Fuel Co., to Chicago Bridge & Iron Co., Chicago.
- 105 Tons, St. Louis, tanks for Socony Vacuum Oil Co., to Alpha Tank & Sheet Metal Mfg. Co., St. Louis, through B. C. Wagner, St. Louis, general contractor.

PENDING PROJECTS

- 105 Tons, Lapine, Ore., outlet pipes for Wickiup Dam (Specification 1250-D); bids July 6.

SHEET PILING

AWARDS

- 3000 Tons, Mobile, Ala., vehicular tunnel, to Carnegie-Illinois Steel Corp., Pittsburgh.
- 900 Tons, Cleveland, Cuyahoga River straightening, cuts Nos. 7 and 8, to Carnegie-Illinois Steel Corp., Pittsburgh, through Great Lakes Dredge & Dock Co.
- 150 Tons, Holland, Mich., municipal power plant, to Carnegie-Illinois Steel Corp., Pittsburgh.

PENDING PROJECTS

- 800 Tons, Melwood, Ark., Little Island Bayou outlet for U. S. Engineers.

PIPE LINES

Phillips Pipe Line Co., Bartlesville, Okla., an interest of Phillips Petroleum Co., same address, has authorized new 8-in. welded steel pipe line from connection with present system in Illinois to point near East Carondelet, Saint Clair County, Ill., vicinity of St. Louis, Mo., for gasoline transmission. Cost over \$850,000 with pumping stations and other operating facilities.

Ohio Fuel & Gas Co., 109 North Front Street, Columbus, Ohio, plans 8-in. steel pipe line for gas transmission, including crossing over East Twenty-first Street bridge.

Standard Oil Co. of Ohio, Midland Building, Cleveland, has purchased 6-in. welded steel pipe line of Tide Water Pipe Co., Ltd., 17 Battery Place, New York, a subsidiary of Tide Water Associated Oil Co., same address, extending from Stoy, Ill., to point near Ohio-Pennsylvania State line, about 450 miles, passing south of Akron, Ohio. From latter point steel pipe line connection will be made with oil refinery at Cleveland, about 30 miles, for transmission of crude oil from Illinois oil field districts to that terminus. Standard company also will make connections from its different oil properties in central Illinois with acquired pipe line at Stoy. Pipe line system to refinery will have a capacity of about 10,000 bbl. per day.

City Council, Detroit, is considering a proposal from Rosedale Oil & Gas Co., John L. Nelson, 2179 National Bank Building, attorney and representative for welded steel pipe line from company gas wells in Wayne County to Wayne County Training School, William H. Maybury Sanatorium and House of Correction for natural gas supply for these institutions. Raymond J. Kelly, corporation counsel for city, is in charge.

Coltex Refining Co., Snyder, Tex., has awarded contract to Coffield & Guthrie, Inc., Corsicana, Tex., for 4 to 6-in. steel pipe line from Sharon, Tex., oil field to point near Westbrook, Mitchell County, Tex., for crude oil transmission. Pumping stations will be installed.

Quartermaster, Fort Sheridan, Ill., closes bids June 30 for extension in pressure pipe lines for steam service (Circular 837-78).

Bureau of Reclamation, Denver, has let contract to Thompson Mfg. Co., Denver, at \$29,535, for welded steel penstocks for Elephant Butte hydroelectric power plant, Rio Grande project, New Mexico-Texas (Item 1, Specifications 1217-D).

United States Engineer Office, First District, New Orleans, asks bids until June 26 for two steel dredge pipes for suction pump lines (Circular 305).

Compagnie Francaise des Petroles, Paris, France, plans new welded steel pipe line from oil field properties in Iraq, Arabia, to point on Mediterranean Sea, for crude oil transmission, making third pipe line of company between these points. New line will require from 24 to 36 months for completion. Cost reported over \$2,500,000 with pumping stations and other operating facilities.

THIS WEEK'S MACHINE ... TOOL ACTIVITIES ...

... Foreign orders again on the increase, pushing up total demand ... Domestic orders disappointing thus far in June, but there are many quotations out on which action is expected shortly.

Chicago June Orders Low But Prospects Good

CHICAGO—The number of orders received in the first half of June has been rather disappointing. Machines placed have been isolated cases, no definite buying pattern being noticeable. Many quotations are out, however, the most promising being on lists issued by the Rock Island Arsenal, and the Milwaukee and Chicago tractor works of International Harvester Co. Buying is expected at any time from the latter concern, as installation is planned for September and October. The delivery on much of the equipment desired will soon extend beyond that date if orders are not in shortly.

Cleveland Builders Busy But New Orders Spotty

CLEVELAND — Production continues strong in this district after the heavy bookings during the past month. Sales distribution up to June 15 proved more spotty than during the comparable period of May.

Patterson Foundry & Machine Co., at East Liverpool has announced it will spend \$50,000 on new machine tools. Thompson Products Co., Cleveland, maker of aircraft parts, is understood to have ordered two new hobbing machines, three lathes and other equipment. The company is broadening its production into new fields. Its operations are at a high level, along with other aircraft suppliers in this district.

Detroit Production Centers On Special Machinery

DETROIT — Manufacture of special equipment in several fields is one of the principal factors in Detroit machine tool activity, although the current season is also seeing the maximum of pressure on tool and die work and machine tools for the automobile plant changeovers—some of which are taking place now. A battery of special type drilling machines will go into operation in one of the Eastern automotive hardware plants as soon as this specially designed equipment is completed. Considerable equipment for the Ford tractor is still not completed although delivery dates are approaching. R. C. Mahon Co., generally known as a structural steel fabricator and steel specialty manufacturer, has developed a new department for the fabrication of welded machine bases. The fabricating shop and engineering design department have been busy on contracts for several machine tool manufacturers.

New England Tool Builders Report Business Good

BOSTON—New England machine tool and small tool manufacturers and their representatives report business as very good with all types of users buying equipment. Buying by the Government is not as brisk as it was a month or so ago, but is a market factor nevertheless. On June 19 the Government closed bids on a motor driven milling machine and four small chambering machines; on June 20 on a 6x18-in. surface grinder; on June 21 on 200 high speed steel hook type rifling cutters; and on June 26 will close bids on three hand operated die sinking machines, all for the Springfield Armory. New Britain, Conn., last Monday (June 19) closed bids on a group of screw machines and milling machines for its trade school.

Buying in the East In the Doldrums

NEW YORK—Sales in the immediate New York area reached a new low last week, owing largely to a momentary lull in purchasing on the part of the aircraft and other industries primarily dependent upon Government contracts. What business there was placed, however, has been well diversified as to source. The trade is not pessimistic because of a large amount of outstanding quotations, on which action is expected daily. New inquiries are at a low level, on the other hand. Most sellers report that the factories they represent are well occupied, and deliveries on some machinery, like lathes, are being quoted as high as 14 to 20 weeks. Fairly substantial backlogs of orders are reported for all machine tool builders, except drill manufacturers.

Gain in Foreign Business Pushes Order Volume Up

CINCINNATI—The local machine tool market steadied itself during the past week, erasing the spotty appearance of the preceding period. New business from foreign sources was largely responsible for the improvement and places the domestic demand again at a disadvantage as compared with foreign business. With other types of machinery supporting the market in consistent demand, lathes, which have largely been responsible for the spotty situation of last week, moved upward to the level which has been well maintained during the entire second quarter. A substantial order from Russian sources for various types of lathes was reported and a fair number of one or two unit orders

for smaller lathes from domestic users also was reported. Milling machines and grinders continue to be active in current ordering, while shapers and brakes show relatively no change. Demand for drilling machinery seems to be broadening, while heavy machinery continues to enjoy good demand, although export business is largely responsible for this. Inquiries tend more active and manufacturers generally seem to be sanguine that action on pending quotations is imminent.

A small step-up in production in some quarters during the past week has been reported, but in allowing for normal weekly fluctuations the average market production is still relatively unchanged at a trifle above 50 per cent of capacity. Shipments are fairly prompt although here and there some difficulty in keeping delivery dates is reported.

TRADE NOTES

Joseph T. Ryerson & Son, Inc., 16th and Rockwell Streets, Chicago, have purchased their Philadelphia plant property at 5200 Gray's Avenue from the Taylor-Wharton Iron & Steel Co. The property, which has been under lease, is being extensively improved.

T. B. Wood's Sons Co. announces the appointment of the Arnold Electric Co., Arlington, Va., as a distributor of V-belt sheaves and V-belts. A complete stock of Wood's sheaves and Wood's V-belts will be maintained at 606 South 24th Street for serving the Washington area.

The Cincinnati Gilbert Machine Tool Co. is the new corporate name of the Drees Machine Tool Co., 3366 Beekman Street, Cincinnati, manufacturer of radial drills and turret machinery. W. A. Hudson, secretary of the company, announced.

Charles Wagner Litho Machinery Co., 51-55 Park Avenue, Hoboken, N. J., a division of National-Standard Co., announces it will make a complete line of industrial ovens, including core and mold ovens, drying ovens, armature and coil ovens, "A" type conveyor ovens and Dulux ovens. The company will continue to serve its customers with decorative metal ovens.

Clevenger & Goodman, 2716 Collingwood Avenue, Detroit, has been organized by John Clevenger, pipe line contractor of Michigan, and I. E. Goodman, former treasurer and general manager of Keystone Oil Refining Co., Detroit. Charles D. Todd will be in charge of Canadian operations. The new firm expects to specialize in the installation of pipe lines and large welded storage tanks.

The Whiting Corp., Harvey, Ill., has moved its Chicago district sales office to the Fisher Building, 343 South Dearborn Street. Personnel of the office consists of Robert S. Hammond, vice-president, and L. D. Reed and G. M. Dennis, sales engineers.

Hewitt Rubber Corp., Buffalo, has expanded its Dallas, Tex., warehouse by 2500 sq. ft. of floor space.

Walter A. Olen, president, the Four Wheel Drive Auto Co., Clintonville, Wis., recently announced the purchase of the heavy duty cab business of the J. L. Clark Mfg. Co., Oshkosh, Wis.

Great Lakes Carbon Corp., New York, announces that it will continue the business of Great Lakes Coal & Coke Co.

Hasler-Tel Co., after more than 15 years at 461 Eighth Avenue, New York, announces its removal July 1 to the Underwood Building, 30 Vesey Street, New York. The company is sole distributor and service headquarters in the United States for the Hasler speed indicator.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Carbide & Carbon Chemicals Corp., 30 East Forty-second Street, New York, industrial chemicals, has approved plans for expansion in branch plant at South Charleston, W. Va., comprising several one and multi-story units for increase in production of synthetic resins and allied products. Cost over \$1,000,000 with equipment. H. E. Thompson is vice-president in charge of construction.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 29 for dynamo units, mountings, maintenance parts, etc. (Circular 275), 18,282 to 19,482 ft. of cable, and six lots of telephone cable in amounts from 5050 to 70,700 ft., and reels (Circular 276); until June 30, plugs, dynamotors, maintenance parts, mountings, etc. (Circular 278).

National Biscuit Co., 449 West Fourteenth Street, New York, will ask bids soon for new branch plant at Murphy and Arden Avenues, Atlanta, Ga., where about 35 acres was acquired recently, to consist of main one-story unit, 300 x 900 ft., with traveling ovens, conveyors, mixing machinery and other mechanical equipment. Part of structure will be used for storage and distribution. Cost close to \$2,000,000 with machinery. Louis Wirsching is company architect and engineer, first noted address.

S. & W. Fine Foods, Inc., 33 Thirty-fourth Street, Brooklyn, packer and canner, has leased large part of three-story building on site bounded by Charles, Washington and West Tenth Streets, New York, for plant.

American Can Co., 230 Park Avenue, New York, has let general contract to Anglin-Norcross, Ltd., 892 Sherbrooke Street, Montreal, for one-story addition to Canadian branch plant at 2065 Jeanne d'Arc Street, Montreal. Cost close to \$350,000 with equipment. Ross & MacDonald, 1010 Ste. Catherine Street West, Montreal, are architects.

Watson Elevator Co., 407 West Thirty-sixth Street, New York, passenger and freight elevators, parts, etc., has let general contract to Bonanno Construction Co., 1827 Bergen Turnpike, North Bergen, N. J., for new two-story and basement plant, 100 x 250 ft., at Englewood, N. J. Cost over \$100,000 with equipment. Company is now operating a plant at 1228 Willow Avenue, Hoboken, N. J., and is said to be arranging to remove to new location on completion of building, where increased capacity will be carried out.

Commanding Officer, Ordnance Department, Raritan Arsenal, Raritan, N. J., asks bids until June 26 for three stainless steel recovery tanks (Circular 115).

Heyer Products Co., Inc., 740 Washington Avenue, Belleville, N. J., electrical testing instruments, parts, etc., has acquired property near Little Street and Bellavista Avenue for new one-story and basement plant, 150 x 480 ft., with two-story center section for office. Cost over \$100,000 with equipment. Company will remove present plants at Belleville and Newark to new location where expansion will be carried out.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until June 26 for carriage bolts (Circular 898); until July 6, four precision surface grinders (Circular 900), broaching machine (Circular 899).

Scott Paper Co., Chester, Pa., has started an expansion program, including several one-story additions. A new paper-making machine and auxiliary equipment will be installed. Cost close to \$1,500,000 with machinery.

Morea-New Boston Breaker Corp., operating Morea colliery, Morea, Pa., has approved plans for new coal breaker at properties. Cost over \$40,000 with machinery.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until June 30 for reworking scrap metals into 580,000 lb. of cartridge brass caps (Circular 1272).

Centerless Products Co., recently organized by A. W. Draghi, A. Draghi and William Kirk, all formerly of Roller Bearing Co. of America and Norman Products Co., Bordentown, N. J., has leased building at 37 Verona Ave., Newark, N. J., for manufacture of small machine pins, centerless grinding and heat treating.

◀ BUFFALO DISTRICT ▶

Worthington Pump & Machinery Corp., Clinton and Roberts Streets, Buffalo, has let general contract to H. F. Stimm, Inc., Elliott Square, for one-story addition, 36 x 175 ft. Cost over \$60,000 with equipment. Main offices are at Harrison N. J.

Eastern States Milling Corp., Ontario Street and Military Road, Buffalo, plans large grain elevator at Huron, Ohio, where site has been acquired to provide both water and rail shipping facilities. Cost over \$350,000 with elevating, conveying and other equipment. Work is scheduled to begin this summer.

Greenway Brewery Co., Inc., 1925 Park Street, Syracuse, N. Y., has let general contract to Samuel Kosoff, 413 Buckingham Avenue, for two-story and basement addition, 35 x 90 ft., primarily for a mechanical-bottling unit. Cost close to \$70,000 with equipment. Wolfe Markam, Everson Building, is architect.

◀ NEW ENGLAND ▶

Stanley Works, Inc., New Britain, Conn., builders' hardware and other metal goods, has let general contract to Hasson & Downes, 55 West Main Street, for two-story and basement addition, 50 x 162 ft. Cost over \$50,000 with equipment. Moore & Salisbury, 967 Farmington Avenue, West Hartford, Conn., are architects.

Bureau of Yards and Docks, Navy Department, Washington, plans new explosives manufacturing building at naval torpedo station, Newport, R. I. Cost about \$250,000 with equipment. Appropriation in that amount has been authorized and work is scheduled to begin soon.

Autocar Co., Ardmore, Pa., heavy-duty motor trucks and parts, has purchased three-story building at 1168 Commonwealth Avenue, Boston, heretofore occupied in part for factory branch, storage and distribution, and will use entire structure for expansion in facilities.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 26 for three hand-operated die-sinking machines (Circular 457).

◀ WASHINGTON DIST. ▶

Eastman Kodak Stores, Inc., 607 Fourteenth Street, N.W., Washington, photographic equipment and supplies, has let general contract to James L. Parsons, Jr., Homer Building, for three-story plant at 1350 Okie Street, N.E. Cost about \$70,000 with equipment. Clifton B. White, 7906 Georgia Avenue, Silver Spring, Md., is architect.

Bethlehem Steel Co., Shipbuilding Division, 1101 Key Highway, Baltimore, has let general contract to Consolidated Engineering Co., 20 East Franklin Street, for one-story shop addition. Cost over \$45,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 30 for horns, contact-makers and sirens (Schedule 6540) for Boston, Charleston and Puget Sound Navy yards; until July 11, hand-type portable fire extinguishers (Schedule

6534) for Brooklyn, Sewalls Point, Mare Island and Puget Sound yards.

Calvert Distilling Co., Relay, Md., has asked bids on general contract for extensions and improvements in local distillery. Cost over \$50,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, will have plans prepared soon for following structures at Navy Yard, Pearl Harbor, T.H.: Graving dock for large vessels, with operating and service equipment, cost \$8,485,000; one-story pipe and copper shop, cost \$150,000 with equipment; one-story galvanizing shop, \$85,000 with equipment; one-story electric shop, \$465,000 with equipment; graving dock for small vessels, with operating and service equipment, \$2,000,000; one-story public works shop and storage building, \$170,000 with equipment; one-story storehouse, with mechanical-handling and other equipment, \$750,000; ordnance shop, \$165,000 with equipment. Also for additional magazine buildings and equipment at ammunition depot, Oahu, H.I., to cost \$223,500; one-story aircraft building and storehouse at Coco Solo, cost \$285,000 with equipment; and for personnel buildings and other structures at last noted air base and submarine base, cost \$1,736,000. Appropriations in amounts mentioned have been authorized.

◀ SOUTH ATLANTIC ▶

Coca-Cola Bottling Co., Asheville, N. C., plans new two-story and basement mechanical-bottling plant. Cost about \$125,000 with equipment. H. I. Gaines, Public Service Building, is architect.

Houser Welding Co., Tallahassee, Fla., R. G. Houser, head, plans rebuilding one-story plant recently destroyed by fire. Loss close to \$65,000 with equipment.

Board of Water Commissioners, Macon, Ga., asks bids until June 27 for 300,000-gal. water tank on 130-ft. tower for municipal water system, South Macon district.

Airport Beacons, Inc., Jacksonville, Fla., care of T. D. Bayley, 2589 Post Street, head, recently organized, plans factory for manufacture of new type of beacon lamps and allied lighting equipment for airports.

◀ SOUTH CENTRAL ▶

Board of Parish Supervisors, St. Landry Parish, Opelousas, La., has been authorized to arrange bond issue of \$175,000 for new cane sugar mill, with power house and other auxiliary buildings. Bids will be asked soon on general contract.

Coca-Cola Bottling Co., Shreveport, La., acquired property at 275 Stoner Avenue for new one and two-story mechanical-bottling, storage and distributing plant. Bids will be asked soon. Cost over \$250,000 with equipment. O. L. Biedenbarn, general manager, is in charge.

Construction Service, Veterans' Administration, Washington, asks bids until June 27 for boiler unit and boiler plant equipment for power house at institution at Tuscaloosa, Ala.

City Council, Pascagoula, Miss., asks bids until July 1 for two 400-gal. per min. motor-driven centrifugal pumping units for municipal waterworks station, with motors, starters, controls and accessories. L. C. Winterton, Pascagoula, is consulting engineer.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 29 for an automatic electric elevator in Chickamauga hydroelectric power plant.

◀ WESTERN PA. DIST. ▶

Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, plans new works for paint division on 21-acre tract in Englewood district, Houston, Tex., comprising several units for paint, varnish and oil manufacture, with adjoining one-story structure for storage and distribution. Cost over \$250,000 with equipment. Company also will use another part of tract for new factory branch, storage and distributing plant for glass and other divisions. Cost close to \$125,000 with equipment.

City Controller, City-County Building, Pitts-

15-HOUR CYCLE for Annealing Malleable Castings

Short-Cycle Continuous Furnace installed in a mid-western manufacturing plant. Designed and built by Holcroft & Company, Detroit.

Lining: 9 in. of B & W K-26 Insulating Firebrick, backed up with 5 in. of B & W K-20; sprung arch, 9 in. of K-26. Dimensions of chamber: 53 ft. by 7½ ft. wide by 3¼ ft. high. Temperature zones vary from 1700 to 1250 F. Capacity: 20 tons in 24 hours. Fired with gas—40 radiant tubes and 15 cooling tubes.

Work goes through this up-to-date furnace in only 15 hours—a remarkably short cycle.

One of the features promoting efficiency is the use of B & W Insulating Firebrick as furnace lining, which assures close temperature control and even heating of the work. Fuel consumption is reduced by reason of the ability to reach operating temperature quickly after a shut-down, and by low radiation loss.

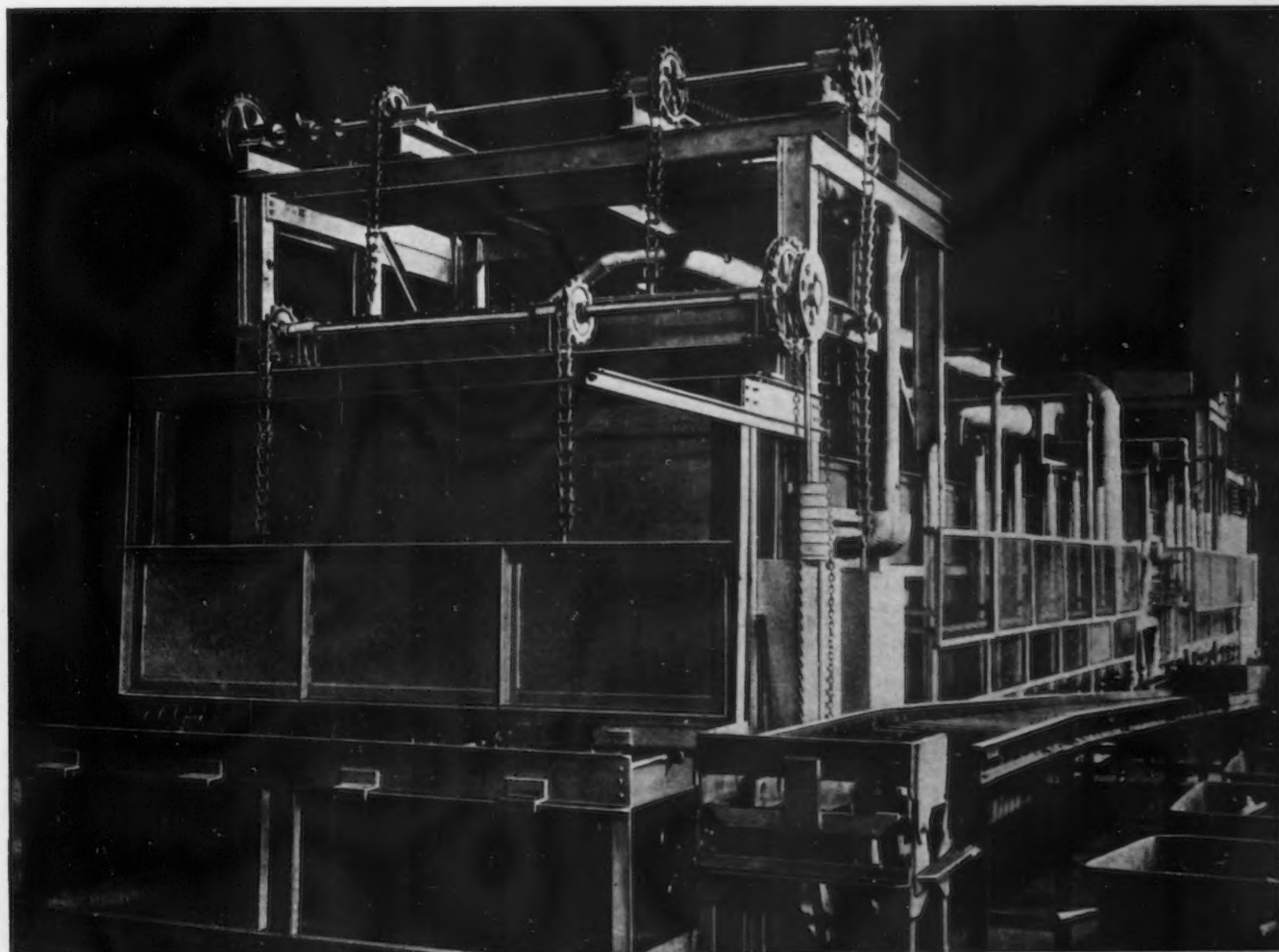
B & W Insulating Firebrick are today saving money for the owners of practically every type of industrial furnace — write for Bulletin R-2-F, which contains technical data.

THE BABCOCK & WILCOX COMPANY
Refractories Division

19 Rector Street

New York, N. Y.

R-24



BABCOCK & WILCOX

burgh, asks bids until June 29 for furnaces and auxiliary equipment for new municipal incinerator plant at Twenty-ninth Street and Allegheny River (Contract No. 3). Frank M. Roessing is director, Department of Public Works.

Pennsylvania Distillery Co., Logansport, Pa., plans four-story and basement addition for storage and distribution. Cost about \$100,000 with equipment.

◀ OHIO AND INDIANA ▶

Standard Oil Co. of Ohio, May and McMillan Streets, Cincinnati, plans new bulk oil storage and distributing plant on local tract of about 14 acres, consisting of a main one-story structure, 120 x 300 ft., one-story office and operating building, 41 x 115 ft., steel tanks, pumping station and auxiliary structures. Cost over \$200,000 with equipment. A. B. Caldwell is local division manager.

Shelby Steel Hinge Co., Shelby, Ohio, hinges and other hardware, has let general contract to Stacy Haun Co., Shelby, for two-story addition, 26 x 57 ft., for storage and distribution. Cost about \$40,000 with equipment.

Tappan Stove Co., 150 Wayne Street, Mansfield, Ohio, has plans for one-story addition for expansion in enameling division. Cost over \$75,000 with equipment.

Smith Meter Co., Gulf Building, Pittsburgh, recording meters for petroleum industry, parts, etc., subsidiary of A. O. Smith Co., Milwaukee, has leased space in building at 2104 Superior Avenue, N.E., Cleveland, for new factory branch, service, testing and distributing plant. Present branch at Pittsburgh will be removed to new location and operations for central area concentrated there. Company has Cleveland branch offices at 1836 Euclid Avenue.

Rotary Printing Co., Norwalk, Ohio, plans rebuilding part of branch plant at New London, Ohio, operated in name of B. F. Harrison Printing Co., recently destroyed by fire. Loss over \$150,000 with equipment.

City Council, Logansport, Ind., plans improvements in municipal electric power plant, including new equipment. Cost over \$50,000. Charles Ammerman, Century Building, Indianapolis, is consulting engineer.

Johnson Oil Supply Co., Gary, Ind., plans new oil skimming plant at 2500 West Ninth Avenue, with bulk storage and distributing facilities. Cost about \$85,000 with equipment.

Streine Tool & Mfg. Co., New Bremen, Ohio, will enlarge its floor space by about 5000 sq. ft., through a stock room addition.

◀ SOUTHWEST ▶

Beech Aircraft Corp., Wichita, Kan., airplanes and parts, will arrange fund of about \$50,000 for purchase of machinery and equipment, in connection with forthcoming sale of 100,000 shares of common stock.

Sinclair-Prairie Oil Co., Tulsa, Okla., plans extensions and improvements in oil refinery at Sand Springs, including additional equipment. Cost close to \$100,000.

Bureau of Mines, Department of Interior, Washington, plans new experiment and research building on campus at Missouri School of Mines and Metallurgy, Rolla, Mo. Cost about \$300,000 with equipment. Appropriation is being secured.

Gulftex Drug Co., Inc., 417 North Main Street, Houston, Tex., has acquired tract at Sampson, York and McKinney Streets for new winery, consisting of one-story units for general production, bottling, storage and distribution. Cost close to \$100,000 with equipment. Work is scheduled to begin soon.

Phillips Petroleum Co., Bartlesville, Okla., plans expansion and improvements in branch oil refinery at Borger, Tex., including additional stills and auxiliary equipment, boiler plant equipment, pumping machinery, additional steel tanks and other storage and distributing facilities. Cost over \$600,000.

Tide Water Associated Oil Co., Esperson Building, Houston, Tex., and Seaboard Oil Co., operating jointly for gas recycling plant at Long Lake, near Tucker, Tex., have authorized doubling capacity of plant, initially designed for capacity for handling 25,000,000

cu. ft. of natural gas per day. Cost close to \$500,000 with machinery.

◀ MIDDLE WEST ▶

Alemite Die Casting & Mfg. Co., Woodstock, Ill., die castings, hardware, etc., has approved plans for one-story addition, 270 x 470 ft. Cost close to \$200,000 with equipment. Company is a subsidiary of Electric Auto-Lite Co., Toledo, Ohio.

Rival Packing Co., 371 South Halsted Street, Chicago, meat packer, has asked bids on general contract for new three-story and basement plant at Forty-fifth Street and Tripp Avenue, 118 x 175 ft. Cost about \$350,000 with equipment. A. Epstein, 2001 West Pershing Road, is consulting engineer.

John Deere Spreader Works, Inc., East Moline, Ill., agricultural machinery and parts, has asked bids on general contract for one-story addition, 80 x 260 ft., to be used as a forge shop. Cost over \$100,000 with equipment. C. A. Eckerman, 1225 Third Avenue, Moline, is company architect.

City Council, New London, Iowa, plans expansion and improvements in municipal electric power plant, including new diesel engine-generator unit and auxiliary equipment. Young & Stanley, Inc., Muscatine, Iowa, is consulting engineer.

Lewis Bolt & Nut Co., 504 Malcolm Avenue, S.E., Minneapolis, Minn., has let structural steel contract to Erickson Construction Co., Minneapolis, for two-story addition, to be used for galvanizing. Cost close to \$65,000 with equipment.

John Morrell & Co., Sioux Falls, S. D., meat packers, have let general contract to Sioux Falls Construction Co., Boyce Greeley Building, for one-story top addition to present six-story U-shaped plant, 95 x 125 ft. Cost over \$75,000 with equipment. Henschien, Evers & Crombie, 59 East Van Buren Street, Chicago, are architects and engineers. Main offices are at Ottumwa, Iowa.

Abbott Laboratories, Inc., Fourteenth Street and Sheridan Drive, North Chicago, chemical products, has asked bids on general contract for two-story and basement addition, to be used largely as a machine shop. One-story boiler house also will be built. Cost over \$50,000 with equipment. Battey & Childs, 231 South LaSalle Street, Chicago, are architects.

◀ MICHIGAN DISTRICT ▶

Monsanto Chemical Co., 1700 South Second Street, St. Louis, industrial chemicals, is considering new branch plant on about 160 acre tract at Trenton, Mich., on which option for purchase has been taken. It will consist of several one and multi-story units, with power house, machine shop and other mechanical departments. Cost over \$2,000,000 with equipment.

Mount Pleasant Metal Products Co., Mount Pleasant, Mich., recently organized subsidiary of Ferro Stamping Mfg. Co., 1367 Franklin Street, Detroit, plans early operation of local plant for production of automobile body parts. Facilities will be provided for working force of about 125 persons.

Bastian-Blessing Co., Grand Haven, Mich., soda fountains, store fixtures and equipment, plans one-story addition, totaling about 35,000 sq. ft. of floor space. Cost close to \$55,000 with equipment. Main offices are at 240 East Ontario Street, Chicago.

Village Council, Grosse Pointe Park, Mich., has rejected bids recently received for new pumping plant with machinery and auxiliary equipment, and will take new bids soon. Shoecraft, Drury & McNamee, Ann Arbor, Mich., are consulting engineers.

◀ PACIFIC COAST ▶

Bureau of Reclamation, Denver, asks bids until July 3 for two 72-in. diameter ring-seal gates for station-service penstocks at Grand Coulee power plant, Grand Coulee, Columbia Basin project, Wash. (Specifications 853); until July 10, two 350-ton, double-trolley, motor-operated overhead traveling cranes and one set of lifting beams (Specifications 851); until July 12, 11 drum gates

for spillway, all for Grand Coulee (Specifications 854).

Permanente Corp., Latham Square Building, Oakland, Cal., has been organized as an interest of Henry J. Kaiser Co., same address, building and engineering contractor, to build cement mill in Permanente Canyon district, near Cupertino, Santa Clara County, Cal., for cement supply for Federal projects in State, including Shasta power dam, Central Valley project, totaling 5,800,000-bbl. of low-heat Portland cement, for which company has secured award at price of \$11,025,892. Work on mill is scheduled to begin soon. It will comprise several production units, with packing, storage and distributing buildings, power house, machine shop, pumping station and other mechanical departments. Cost close to \$3,500,000 with machinery.

Coca-Cola Bottling Co., Seattle, has let general contract to Teufel & Carlson, Skinner Building, for one-story mechanical-bottling plant. Cost close to \$225,000, with equipment. Jesse M. Shelton, Atlanta, Ga., is architect; Graham & Painter, Dexter-Horton Building, Seattle, are associate architects.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until June 28 for lighting and power system for foundry at Mare Island Navy Yard (Specifications 9177); also bids, no closing date stated, for seven electric freight elevators and hoistway doors, same yard (Specifications 9151). Bureau has plans for power house and torpedo storage and distributing building at destroyer base, San Diego, Cal. Cost about \$140,000 with equipment. Appropriation has been authorized in that amount.

Vega Airplane Co., 1627 Victory Place, Burbank, Cal., airplanes and parts, has begun erection of one-story assembling unit, for which general contract recently was let to MacIsaac & Menke, 6624 Stanford Avenue, Los Angeles. Cost over \$70,000 with equipment. John and Donald B. Parkinson, Title Insurance Building, Los Angeles, are architects.

◀ FOREIGN ▶

Department of Works, Government of Australia, Canberra, New South Wales, Australia, asks bids until July 4 for one jib crane, oil engine-operated, for use at Darwin. Postmaster General's Department, same address, closes bids on same date for testing instruments (Schedule C-2414).

Yorkshire Electric Power Co., Thornhill, England, plans new steam-electric generating plant at Mexborough, on 18 acre tract. Cost about \$5,000,000 with turbine-generator units, high-pressure boilers using coal as fuel, and auxiliary equipment. Plant will require about 36 months for completion.

Canadian Copper Refineries, Ltd., Durocher Avenue, Montreal, has let general contract to Foundation Co., Ltd., 1538 Sherbrooke Street West, for one-story addition to main refinery, 120 x 240 ft. Cost over \$150,000 with equipment.

Heppenstall Signs Contract with SWOC

PITTSBURGH—The Heppenstall Co. here has signed its first contract with the SWOC, according to union officials. Chief feature of the contract is the provision for vacations with pay and the agreement in general follows the setup in other steel contracts, including the 62½c. minimum wage and the 40-hr. week. According to Philip Murray, chairman of the SWOC, the signing of the Heppenstall contract brings to 593 the number of steel producers and fabricators with which agreements have been reached.